APPENDIX A

Improvement Plan Review Checklist

CITY OF LATHROP IMPROVEMENT PLAN REVIEW CHECKLIST

TRACT NAME:_____DEVELOPMENT NO._____

Engineering Firm:_____

Contact Person:_____

Telephone Number: (_____)_____

Assessor's Parcel No.:_____

Tentative Map Expiration Date:_____

( ) First Check ( ) Recheck

_____	3	Sets of Grading and Improvement Plans
_____	2	Sets of Hydrology Map and Calcs
_____	3	Copies of Engineer's Estimate
_____	2	Copies of Soil Report
_____	2	Sets of Sewer Map and Calcs
_____	1	Copy of Approved Tentative Map
_____	1	Copy of Final Conditions of Approval (Resolution)
_____	3	Sets of Final Map Package
_____	3	Sets of Landscaping and Irrigation Plans
_____	3	Sets of Signing and Striping Plans
_____	3	Copies of Wall Calculations
_____	3	Copies of Trench Calculations
_____	1	Set of AutoCAD Drawing files (3½" 1.44 Mb floppy disks on final submittal)
_____	2	Scanned Files of Final Plans on CD (.GIF, .JPG or .TIF format on final submittal)

Preliminary Engineer's Estimate $ _____

Preliminary Plan Review Fee $ _____

Final Bond Estimate $ _____

Final Plan Review and Inspection Fee $ _____

Plan Storage Fee (on final submittal) $ _____

I. GENERAL

_____ 1. Plans on 22" X 34" plan sheets.

_____ 2. North arrow and scale on each sheet. North up and/or left.

_____ 3. Titles and numbers on all sheets and match index.

_____ 4. Conformance to Tentative Map and Conditions of Approval, especially street and R/W widths, grading, drainage, sewerage, water lines, number and size of lots, etc.

_____ 5. Plans are prepared in AutoCAD and Layers conform to City Standard Layer.

II. TITLE SHEET

_____ 1. Name of Subdivision or project

_____ 2. Subdivision Number and Assessor's Parcel Number (APN)

_____ 3. Vicinity Map with north arrow (north up and/or to the left).

_____ 4. Sheet Index.

_____ 5. City Engineer's Signature Block.

_____ 6. Consultant Signature Block and Geotechnical Engineer's Signature on Grading Plan.

_____ 7. Standard Notes per Section 2-3.2 of the Standards. (may be on Sheet 2)

_____ 8. Other required signature blocks.

III. SHEET TWO (AND THREE IF REQUIRED)

_____ 1. Map showing all streets, utilities, structures, etc. and show improvement plan sheet layout. (1" = 100' minimum scale)

_____ 2. Drafting symbol legend per Section 2.

_____ 3. Street sections and pavement schedule shown.

_____a. Structural sections shown and agree with City Standards.

_____b. Curb shown.

_____c. Right-of-way and street widths shown.

_____d. Cross-slope shown-note relative difference to T/C.

_____e. Sidewalk shown.

_____f. Pedestrian paths shown.

_____g. Drainage channels and pipes shown.

_____ 4. Temporary and permanent bench marks and descriptions

_____ 5. List of Abbreviations.

_____ 6. Pavement Chart (R value, TI, AC, AB, AS and street name) (see example layout in Section 2-3.1 (F) (10))

IV. DEMOLITION AND ABANDONMENT PLAN

_____ 1. Show existing buildings and structures.

_____ 2. Existing septic tanks and leach fields shown.

_____ 3. Existing wells shown.

_____ 4. Show trees to be removed and tag/label trees to be saved.

V. GRADING PLANS

_____ 1. Existing elevation or contours shown and extend 50' beyond boundary.

_____ 2. Proposed pad grades and correct relationship to TC grades.

_____ 3. TC elevations at property line extensions.

_____ 4. TC at grade breaks and curb returns shown.

_____ 5. TC at storm drain inlets shown.

_____ 6. Storm drain lines and structures shown.

_____ 7. Street slopes at centerlines shown. (0.5% minimum)

_____ 8. Lot numbers shown.

_____ 9. Retaining walls, fences, and sound walls shown.

_____ 10. Plan view of typical lot drainage. Minimum slope of lots 1%.

_____ 11. Section of typical lot to show property line/slope relations.

_____ 12. Show grading required for off-site drainage.

_____ 13. Grading shown between back-of-curb or sidewalk and original ground at right-of-way line.

_____ 14. Grading conforms to adjacent properties are shown correctly and there is no adverse effect on future development.

_____ 15. Check no drainage across lot lines and lots to drain to streets.

_____ 16. Maximum slopes 2:1 or per Soils Report.

_____ 17. All pads above high water when storm drains plug. (Surface flows)

_____ 18. Elevations at rear of lots shown.

_____ 19. Driveway slopes per standard

_____ 20. Grading permit per UBC Ch. 33

VI. STREETS

A. Plan Views

_____ 1. Wheelchair ramps shown per Standard Details R-10A and R-10B and in compliance with ADA guidelines.

_____ 2. Radius of curvature, central angle, and length shown on all street curves.

_____ 3. Curb curve data given - central angle, length, and radius (See Section 6-5.4)

_____ 4. Scale 1" = 40' or 1" = 20'.

_____ 5. Cul-de-sac radius (see Standard Detail R-18)

_____ 6. Property corner cutoffs used when wheelchair ramps installed, otherwise concentric with curb. (see Section 6-4.4G)

_____ 7. R/W and street width dimensions shown.

_____ 8. Centerline stationing at 100' and at BC and EC of curves.

_____ 9. Lot/parcel lines and numbers/letters shown.

_____ 10. Cul-de-sac cross slopes from high point to gutter lip (See Standard Detail R-18).

_____ 11. Valley gutters (at cul-de-sac entry only) - show flow lines at center of street.

_____ 12. Stationing on all drainage structures shown.

_____ 13. T/C elevation given at all drain structures.

_____ 14. Drainage easements shown and dimensioned.

_____ 15. Location of proposed and existing underground pipes and utilities shown.

_____ 16. Location of fire hydrants.

_____ 17. Street monuments shown.

_____ 18. Bench Mark locations shown

_____ 19. Pedestrian Paths shown. Basic grades shown.

_____ 20. Street names shown.

_____ 21. Stations and elevations street intersections shown.

_____ 22. All notes and symbols standard and conforming to legend.

_____ 23. All existing utility poles, manholes, valves, signs, mail boxes, trees, etc. shown. Indicate those to be removed, relocated or adjusted to grade.

_____ 24. Continuations and cross streets properly referenced (Match line–See sheet #)

_____ 25. Project limits and City limits shown.

_____ 26. Standard knuckle and cul-de-sacs used.

_____ 27. Street signs, traffic signs and barricades shown in proper locations.

_____ 28. Station centerline of driveways and width shown (4’ minimum of full height vertical curb between driveway transitions and 2’ minimum to property line).

_____ 29. Minimum sight distance at intersections and curves observed.

B. Profiles

_____ 1. Vertical curves designed for proper speeds per Highway Design Manual.

_____ 2. Minimum vertical curve lengths observed.

_____ 3. Vertical scale 1" =2'.

_____ 4. Vertical Curve used for grade breaks greater than 1% on local streets, 0.5% in collectors or higher.

_____ 5. In cul-de-sacs, show profiles at centerline and TC profile through the radius point top of curb at end of cul-de-sac (dashed line).

_____ 6. 2% maximum grade observed across intersections.

_____ 7. 0.5% minimum grade observed on all streets at curb.

_____ 8. All underground pipes and utilities shown; storm drain, water and sewers.

_____ 9. Fire hydrants are located at high points in water mains.

_____ 10. Existing ground on centerline shown.

_____ 11. Finished grade profile for top of curb shown.

_____ 12. Centerline profiles of intersecting streets shown on their point of intersection with slopes called out.

_____ 13. Off-tract profile to catch point shown where road is constructed to subdivision boundary. (min. 50’ beyond tract boundary)

_____ 14. Centerline stations and elevations shown at all BVC, EVC, PIVC, grade breaks, low points and high points and TC or rim elevation at all drainage structures.

_____ 15. All slopes in profile shown.

_____ 16. Show all utility crossings with outside diameter (O.D.) clearances indicated.

_____ 17. Manhole and drop inlet invert and flow line elevations shown.

_____ 18. Elevation at high and low points of water mains shown.

_____ 19. Top of Curb profile bulbs and/or returns shown

_____ 20. Profile of through street holds across intersection.

VII. SANITARY SEWERS

_____ 1. System in agreement with tentative map and master plan.

_____ 2. Design conforms to City Design and Construction Standards.

_____ 3. Size of line shown. (8" min.)

_____ 4. Adequate cover. (3' min to finished grade) ductile pipe or engineered alternatives if shallower.

_____ 5. Clearance with water main. (min 1’ O.D. to O.D.)

_____ 6. Size, slope, length between structures, and type of pipe.

_____ 7. Show connection to existing facilities with existing invert. Manhole installed when tying to existing lines.

_____ 8. Extension pipe lines to subdivision boundary for future use.

_____ 9. Sewer line to be located per Standard Details R-35 thru 37.

_____ 10. Curves allowed within 80% of recommendation of pipe manufacturer. Show curve data or offsets if concentric with centerline.

_____ 11. On all curves where short pipe lengths are used indicate clearly on plans.

_____ 12. Top of manhole elevations shown.

_____ 13. Stations given for manholes.

_____ 14. Sizes of existing lines shown.

_____ 15. Pipe types allowed. (D.I. if cover requires it).

_____ 16. 350' maximum distance manhole on mains smaller than 24", 400' maximum distance manhole to manhole on mains 24" and larger and 250' manhole to flushing.

_____ 17. Minimum 2 fps velocity.

_____ 18. 0.2' drop through manhole with change of direction.

_____ 19. Bolted manhole covers for any off street manholes or when manhole is deeper than 10’.

_____ 20. In unimproved areas, manholes extended 1' above ground.

_____ 21. Sanitary calculations.

_____ 22. Laterals shown in plan and 11' center to center from water services and 3' below water if crossing. (Follow health department diagram.)

_____ 23. Special approval areas shall be noted in profile (less than minimum cover and clearances).

_____ 24. Spacing between opposing laterals observed.

_____ 25. Manhole types per City Standard Details.

VIII. DRAINAGE

A. Hydrology-Hydraulics

_____ 1. Calculations per City Design and Construction Standards and based on 10-year 48-hour storm with minimum velocity of 2 fps and max. per Table 3-4.

_____ 2. Calculations shall include: HGL, FL, EL, Q, A, S, V, freeboard at structures, structure losses, and tail water assumptions and legend of abbreviations.

_____ 3. Adequacy of in-tract and off-tract drainage system verified.

_____ 4. All starting water surface and tributary area calculations adequately verified.

_____ 5. Drainage map showing street system, existing and proposed drainage system, slope arrows, tributary sub-areas in acres, peak flow in all pipes (1" = 100' preferred).

_____ 6. All pipe and structures in tributary areas labeled to correspond with calculations.

B. Easements

_____ 1. Off-tract drainage improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for drainage easement submitted for review. (Plat and description)

_____ 2. Off-tract work to be done but no easement requirements. Right of entry submitted for review.

_____ 3. Easement widths indicated.

_____ 4. Easements across lots not permitted.

C. Structures

_____ 1. Max. Diameter pipes through drainage structures observed.
Standard inlet - 24”
Manhole Base - > 24”

_____ 2. 1.00' minimum HGL to top of grate. (10-year storm)

_____ 3. Special structure calculations provided.

D. Pipes

_____ 1. Closed conduit minimum slope of 0.005 observed.

_____ 2. Size, slope, length between structures, type and class or thickness of pipe shown in profiles. (15" minimum).

_____ 3. RCP is only allowed pipe type with a minimum of CL III (See Section 3-6.3 A)

_____ 4. Trunk lines 1.25' behind top sidewalk.

_____ 5. On all curves where non-standard pipes are to use, indicate clearly on the plans.

_____ 6. Outlet protection provided.

_____ 7. 3' minimum cover over pipe to finished grade observed (provided manufacturer specs does not require more) unless special design and calcs submitted.

_____ 8. Curve radii allowed to within 80% of pipe manufacturers recommendation

_____ 9. All curve data at centerline of pipe shown unless concentric with street where offsets allowed.

_____ 10. Elevations, slopes and distances all mathematically correct.

_____ 11. Match hydraulic/hydrology calculations.

_____ 12. Lines in proper location per standards

_____ 13. At changes in pipe size, match soffits.

E. Temporary Storm Drain Retention Basins

_____ 1. Runoff and volume calculations per City Design and Construction Standards.

_____ 2. Groundwater level shown on basin section.

_____ 3. Basin bottom 2' above water table

_____ 4. Outfall protection using riprap required and safety grate on pipe.

_____ 5. Chain link fence with slats around basin required.

_____ 6. Off-tract basins require an access road around the basin.

_____ 7. Easements

F. Channels

_____ 1. Maximum velocity in earth channel verified by soils report (min. 2 fps)

_____ 2. Channel side slopes as specified by soils report

_____ 3. Channel design per design standards

IX. WATER LINES

_____ 1. System in agreement with Tentative Map.

_____ 2. Design conforms to City Design and Construction Standards.

_____ 3. Size - 8" min. Except cul-de-sacs without hydrants where 6" is allowed.

_____ 4. Valves (min 3 at cross and 2 at tee)

_____ 5. Hydrants - locations as shown on approved Tentative Map.

_____ 6. Cover - 3' min. to finished grade.

_____ 7. Proper separation from sewer lines. (See Section VII. 22. of this checklist)

_____ 8. Location - per City Standard Details.

_____ 9. Lines kept in streets - easements not allowed.

_____ 10. Crossings with sewer mains or laterals meet health standards

_____ 11. Length, size and class of pipe shown in profile.

_____ 12. Length shown as distance between crosses or tees.

_____ 13. Invert elevations shown at grade breaks, high and low points.

_____ 14. Sizes of all existing lines shown.

_____ 15. Top of curb at hydrant locations.

_____ 16. Curves allowed to within 80% of pipe manufacturer’s recommendation. Curve data shown unless concentric with street improvements where offsets are acceptable.

_____ 17. Air and vacuum valves at high points and elevated cul-de-sacs if difference in elevation greater than ½ pipe diameter.

_____ 18. Connection to existing facilities.

_____ 19. At points of future extension install temporary blow off with valve.

_____ 20. Lines extended to tract boundaries and along frontage.

_____ 21. House services shown in plan and stationed or dimensioned from the centerline of driveway.

_____ 22. If home is larger than 4,000 square feet, the water service line has been sized for fire sprinklers and fire sprinklers are provided.

_____ 22. Fire hydrant maximum spacing – 500' residential and 300' other. Hose lay lengths 250' residential and 150' other. Cul-de-sacs within 200' of radius points.

_____ 23. Place valves and blow-offs behind sidewalk.

X. STREET LIGHTING

_____ 1. Shown on 100-scale plan.

_____ 2. Cul-de-sacs - _____ watt at end of 100 foot deep or deeper.

_____ 3. Residential streets – evenly spaced at _____ feet maximum. _____ watt on 28'6" poles with 12' arms. (min. luminance ratio is 6 to 1).

_____ 4. Collector Streets – evenly spaced at ____ feet maximum. _____ watt on 28'6" poles with 12-foot arms. (min. luminance ratio is 4 to 1).

_____ 5. Arterial Streets – evenly spaced at ____ feet maximum, _____ watt on 30'00" poles with 15 foot arms. (min. luminance ratio is 3 to 1).

_____ 6. Wattage and pole heights indicated on plans.

_____ 7. Provide calculations

XI. ENGINEERING COST ESTIMATE

_____ 1. Verify that unit costs agree with City Standard Costs. Check that costs are current version.

_____ 2. Verify quantities of all items

_____ 3. Review with plans to determine if there are missing items

_____ 4. 20% contingency required

_____ 5. Grading quantities shown – lump sum not acceptable

_____ 6. Driveways included as separate item

_____ 7. Sidewalk on lineal foot not included in curb and gutter item

_____ 8. Increase costs of facilities installed in existing streets by 50%

_____ 9. Check groundwater depth. If pipes installed below water table, increase costs by $15.00 per lineal foot.

_____ 10. For each 20 electroliers, one extra is required

_____ 11. At re-submittal, changes in plans are reflected in the estimate.

APPENDIX B

General Record Maps Review Checklist

GENERAL RECORD MAPS REVIEW CHECK LIST

GENERAL

_____ 18" x 26" sheets

_____ CLEAR 1" margin around sheet

_____ Map legibly drawn and printed

_____ Map in black on tracing cloth or polyester film

_____ Each sheet numbered with respect to the total number of sheets

_____ ALL lettering and numbering a minimum 0.10" high

_____ Map title appropriately worded containing geographic location

_____ Map have appropriate statements/certificates:

1. Owner's
2. Trustee's
3. Beneficiary's
4. Engineer's
5. Surveyor's
6. Irrigation District's
7. Planning Director's
8. County Surveyor's
9. City Engineer's
10. Planning Commission's
11. City Clerk's
12. City Council's
13. Clerk of the Board of Supervisors'
14. County Recorder's

_____ All statements/certificates dated, signed and sealed as appropriate

1. Owner's
2. Trustee's
3. Beneficiary's
4. Engineer's
5. Surveyor's
6. Irrigation District's
7. Planning Director's
8. County Surveyor's
9. City Engineer's
10. Planning Commission's
11. City Clerk's
12. City Council's
13. Clerk of the Board of Supervisors'
14. County Recorder's

_____ All registration expiration dates noted

_____ Deed References shown on map

_____ REQUIRED vicinity map, scale, and the site location clearly shown

_____ REQUIRED index (key) map shown (for more than 2 sheets only)

_____ Each sheet's relationship to adjoining sheets shown

_____ Map oriented with north to top or left side

_____ North arrow and scale shown

_____ Scale large enough to show details clearly

_____ Boundary of subject property shown with a HEAVY line

_____ Proper survey procedures used (i.e., perorations section breakdowns, deed interpretations, proper control scheme). Section and ¼ section corners physically set and not just calculated (¾" x 30" iron pin-minimum monument size)

_____ ALL surrounding surveys and the related monumentation properly evidence the establishment of boundary shown

_____ Sections, townships, ranges and grants properly labeled

_____ Discrepancies of less than 1/10,000 in precision with existing record data shown

_____ Record data shown by individual reference

_____ All City limits and County lines shown

_____ All Easements show Deed Reference, size and location relative to property lines

_____ PRIVATE Easements properly labeled

_____ Restricted Access areas labeled and shown

_____ All curve data shown (i.e., lot/curve No., radius, central angle, are length, chord bearing, chord distance and radial bearings of non-radial lines.)

_____ Curve data for the TOTAL curve shown

_____ Sum of the parts EQUAL the total distance or central angle

_____ All street names shown along with their widths

_____ "Basis of Bearings" shown and does it identify the actual bearing and the filing data of the referenced map (Must be between two found monuments)

_____ If California Coordinate System – 83, Zone III is used as a basis of bearings, shown bearing, grid factor and filing data

_____ Control scheme shown along with Description of Monuments found for CCS-83, Zone III California Grid coordinates shown, if required

_____ Legend include symbols for monuments founds, set or replaced and a listing of ALL abbreviations used on map (See "ABBREVIATIONS, SYMBOLS, AND NOTES" in Section 2-4.2 or the City of Lathrop Design and Construction Standards).

_____ Calcs show radial bearings

_____ Existing street names spelled correctly

_____ References to Record of Surveys use "Volume" for 1 thru 12 and "Book" 13 to Present

_____ Monuments found or replaced, described as to kind, size, location, tag no., and other data relating thereto. Reference given to a record map or field book where the monument was set or accepted. If none, state no record or origin unknown.

_____ San Joaquin County Surveyor's Base Map Sheet No. shown in the lower left corner, but not in margin – SAMPLE: (D.D. Sheet No.)

_____ Does original submittal include:

A. Two (2) prints of map signed/notarized by Owners and Trustees?

B. Map checking Fee payable to City of Lathrop

C. Boundary closure Calcs?

D. California Coordinate Systems Calcs, if required?

E. Copies of any unfiled surveys used on maps?

F. Copies of Deeds referenced on map including subject property deed?

G. Copies of all senior conveyances/deeds called for in the surveyed property's deed?

H. Subdivision/Parcel Map Guarantee?

I. Preliminary Title Report less than 6 months old?

J. Two (2) copies of signed. sealed new legal description?

APPENDIX C

Final Map Checklist

CITY OF LATHROP
FINAL MAP CHECK LIST

Tract Name: _____ Subdivision No.: _____
Engineering Firm _____
Contact Person _____
Telephone Number _____
Tentative Map Expiration Date _____

I. GENERAL

_____ 1. Agrees with the approved Tentative Map
_____ 2. Tentative Map Current or Extended
_____ 3. Complies with Conditions of Approval (i.e. survey, dedications, notes)
_____ 4. Easements and monuments correspond with improvement plans
_____ 5. Title Report current (within 6 months)
_____ 6. Reference maps, deed, etc. of adjacent properties and those referred to in Title

II. DEDICATION AND STATEMENTS

_____ 1. Owner's statement with dedication
_____ 2. Trustee's statement.
_____ 3. Surveyor's/Design Engineer's statement including signature, seal, number and expiration date
_____ 4. Soils Engineer statement
_____ 5. All statements, signed and acknowledged with signatures and notary seals legible, using black India ink
_____ 6. All Engineers' and Surveyors' numbers comply with Subdivision Map Act. (i.e. Pre-1982 CE No. is smaller than 33966)
_____ 7. Clerk's statement accepting dedications made in Owner's statement.

* See statements in Section 2-5. 1 of the Design and Construction Standards.

III. MONUMENTATION

_____ 1. All found monuments tied by survey and described with tag numbers and recorded reference.
_____ 2. Basis of bearings: Two found monuments of record must appear in a statement and be labeled on the map.
_____ 3. Show tie to basis of bearings.
_____ 4. Monument the ROW, at B.C., E.C., and boundary line if necessary.
_____ 5. A monumental line shall be shown on all new subdivision streets with ties to right-of-way and boundary.
_____ 6. All tract corners to be monumental (tagged I. P.).
_____ 7. Add note: Chisel ‘X’ in curb at property line extension.

IV. DISTANCE AND BEARINGS

_____ 1. Show all bearings, distances, and curve information shown to nearest .01 foot and nearest second.

_____ 2. Curve data (interior angle, delta, radius, and curve length).

_____ 3. Radial bearing on all non-tangent curves.

_____ 4. Basics of Bearing statement on each map sheet.

_____ 5. Areas net and gross (to nearest .01 square foot of area).

_____ 6. Minimum road centerline radius as Agency directs. Street width setback lines, and/or required widening must be shown on map.

_____ 7. Common radial bearings shall be identical in the closures.

_____ 8. Radial/curve relationship shall be tangent.

_____ 9. Lot size shall be verified by area, width and depth.

_____ 10. Sums of lines or curves shall be equal to the incremental parts.

_____ 11. Math closures must be correct to one part in 20,000 for lots and one part in 100,000 for boundary.

_____ 12. Math closures are traverse type and on an acceptable common coordinate system. (no inverse).

_____ 13. Curve/bearing data table on each sheet.

V. MAP BODY

_____ 1. Map suitable for microfilming, if applicable.

APPENDIX D

Parcel Map Checklist

PARCEL MAP CHECK LIST

I. GENERAL

_____ Parcel Map Guarantee matches **EXACTLY** with Owner's/Trustee's/ Beneficiary's names.

_____ All Owner's/Trustee's/Beneficiary's signatures dated and notarized.

_____ Date of Owner's/Trustee's/Beneficiary's signatures match the corresponding certificate.

_____ Notary **PRINTED** his name under his signature and shows the expiration date of his Notary License.

_____ Notary's Seal, if used, matches certificate as to State/County and expiration Date.

_____ **ALL** necessary Offers of Dedication to the Public for Public Use are made (i.e., Streets, Roads, right-of-way widening, Public Utility Easements, etc.).

_____ All necessary Offers of Dedication to the local agency are made (i.e., Access rights, lot (No.), storm drain retention pond site, well site, pump station site, etc.); Certificate of Dedication required?

_____ Appropriate statement/certificate accepting or rejecting Offers of Dedication match **EXACTLY** the Offer of Dedication made by Owners.

_____ **ALL** Easements and Restricted Access Rights reflected in the Preliminary Title Report are shown.

_____ All street widening is properly labeled (i.e., 10' right-of-way dedication).

_____ Parcels on the Parcel Map are numbered or lettered.

APPENDIX E

City of Lathrop Benchmark Monument Reports

City of Lathrop

Department of Public Works
390 Towne Centre Drive, Lathrop, CA 95330
Phone (209) 941-7430 – fax (209) 941-7449
www.ci.lathrop.ca.us

April 26, 2017

Legislation changes effective January 1, 2015
Senate Bill No. 1467, Chapter 400

"SURVEY MONUMENT PRESERVATION"

Section 16: Section 8771(d) of the Business and Professions Code (Land Surveyor's Act):

(d) The governmental agency performing or permitting construction or maintenance work is responsible for ensuring that either the governmental agency or landowner performing the construction or maintenance work provides for monument perpetuation required by this section.

The City of Lathrop has modified the Grading and Building permit process to ensure there is an individual in responsible charge of the Land Surveying activities within the bounds of the permitted construction. The individual shall be a Licensed Land Surveyor or a Professional Engineer authorized to perform Land Surveying in the State of California. It shall be at the sole discretion of the City Land Surveyor to determine if the permitted construction activity warrants the need to fulfill this requirement.

- Minor construction activity where there is no potential for jeopardizing monuments would be a situation where the City of Lathrop would not require the permittee to designate an individual in responsible charge of the Land Surveying activities within the bounds of the permitted construction.

- All other permitted construction activity will require an acknowledgement signed by an individual in responsible charge of the Land Surveying activities within the bounds of the permitted construction prior to issuance of the permit. Prior to final acceptance of the construction activity, the City of Lathrop will require another acknowledgement signed by the designated individual in responsible charge of the Land Surveying activities, stating that all monuments within the bounds of the permitted construction have been preserved.

City of Lathrop

Department of Public Works
390 Towne Centre Drive, Lathrop, CA 95330
Phone (209) 941-7430 – fax (209) 941-7449
www.ci.lathrop.ca.us

Acknowledgement of Monument Responsibility
"Pre-Construction"
Monument Preservation prior to construction activity

I, _____, a duly Licensed Land Surveyor or a Professional Engineer
(Please print)

authorized to perform Land Surveying in the State of California, Registration No. _____,

hereby acknowledge and accept all responsibility for the monument preservation as required per Section 8771(a-f) of the Business and Professions Code within the bounds of the construction activity permitted by the City of Lathrop Permit No. _____.

Construction Site Address: _____.

I further acknowledge that I am hereby responsible for the Acknowledgement of Monument Preservation prior to final acceptance of the construction activity.

_____ Seal
Signature

_____
Date

City of Lathrop

Department of Public Works
390 Towne Centre Drive, Lathrop, CA 95330
Phone (209) 941-7430 – fax (209) 941-7449
www.ci.lathrop.ca.us

Acknowledgement of Monument Preservation
"Post Construction"
Monument Preservation prior to final acceptance of construction activity

I, _____, a duly Licensed Land Surveyor or a Professional Engineer
(Please print)

authorized to perform Land Surveying in the State of California, Registration No. _____,

hereby acknowledge and accept all responsibility for the monument preservation as required per Section 8771(a-f) of the Business and Professions Code within the bounds of the construction activity permitted by the City of Lathrop Permit No. _____.

Construction Site Address: _____.

I hereby state that all monuments within the bounds of the construction activity are in the original location or have been reset in accordance with Section 8771(a-f) of the Business and Professions Code.

_____ Seal
Signature

_____
Date

CITY OF LATHROP

HORIZONTAL CONTROL & BENCHMARK NETWORK

■ 2006

Point ID	Northing	Easting	Elevation
1001	2134817.082	6340929.208	23.97
1002	2134942.056	6336134.298	18.72
1003	2133598.027	6335470.091	17.28
1004	2133675.038	6327798.776	10.098
1005	2133046.993	6324873.116	27.25
1006	2132259.626	6335225.764	18.04
1007	2132119.983	6335447.979	18.49
1008	2131038.814	6334988.262	16.53
1009	2129578.418	6334958.972	17.46
1010	2127506.827	6330346.446	0.56
1011	2127489.831	6334288.097	14.56
1012	2128424.736	6336802.101	14.39
1013	2125632.971	6327495.401	28.70
1014	2125610.394	6333736.102	15.03
1015	2124307.667	6334397.85	18.70
1016	2125469.465	6336093.952	16.70
1017	2124762.373	6336910.152	16.57
1018	2124232.436	6341152.87	54.16
1019	2121699.964	6332520.31	14.97
1020	2121668.939	6333449.582	15.55
1021	2121917.234	6335098.17	18.75
1022	2121481.063	6337648.817	19.96
1023	2118370.598	6314090.646	11.04
1024	2120124.712	6328404.5	10.42
1025	2119991.035	6332575.626	16.19
1026	2118943.012	6337027.605	22.37
1027	2118937.388	6341517.605	24.75
1028	2118788.617	6328650.881	13.56
1029	2117404.869	6328695.911	14.48
1030	2117542.77	6331265.114	14.53
1031	2115941.799	6327065.311	31.05
1032	2116165.968	6329275.539	10.76
1033	2116034.069	6331156.94	12.10
1034	2114519.445	6330407.973	11.85
1035	2112659.585	6330519.652	18.93
1036	2113618.048	6333477.335	11.28
1037	2113538.947	6336512.543	30.10
1038	2113688.527	6340224.889	24.45
1039	2111209.529	6324090.523	17.26
1040	2109977.103	6328543.255	33.56
1041	2111261.845	6329819.279	19.08
2004	2122503.667	6341480.849	21.17
2006	2144758.059	6333794.921	16.60
2024	2117914.272	6320437.62	19.23
2025	2104564.851	6322838.443	27.25

LEGEND

▲ 2" DISC ON RED POLYROC MONUMENT BLOCK WITH 24" FENO ANCHOR

■ 3" USC&GS BRASS DISC IN CONCRETE

⊙ FOUND WELL MONUMENTS

SCALE: 1"=1000'

1000 0 1000 2000 3000

GRAPHIC SCALE

RBF CONSULTING
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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1001**
Point Name: **DANIEL**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: DANIEL

Center Mark: Triangle w/Punch

Location:

Exit Roth Road from I-5. Go east on Roth Road 0.8 miles to the Union Pacific Railroad tracks. Monument is set near the intersection of tracks and Roth Road, 70 feet southerly of edge of pavement, 30 feet west of nearest tracks and 30 feet southeasterly of the Union Pacific Railroad control box "833.921.K"

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°51'19.27074"N

Longitude: 121°15'52.47498"W

Ellipse Height (m): -24.693

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	650,693.548	2,134,817.08
Easting:	1,932,719.088	6,340,929.21
Combined Factor:	0.9999347	

NAVD88 Elevation (MSL)

Meters	Feet
7.31	23.97

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1002**
Point Name: **ROTH**

Monument Description: Found Date: 9/1/2005

2" Disc in Concrete

Stamping: CA. DIV. OF HIGHWAYS "23"
Center Mark: Punch

Location:

Exit Roth Road from I-5. Monument is in centerline of Roth Road in median on the easterly side of I-5, 180 feet easterly from north bound overpass.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°51'20.11477"N

Longitude: 121°16'52.27514"W

Ellipse Height (m): -26.315

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	650,731.640	2,134,942.06
Easting:	1,931,257.596	6,336,134.30
Combined Factor:	0.9999350	

NAVD88 Elevation (MSL)

Meters	Feet
5.71	18.72

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1003**
Point Name:

Monument Description: Found Date: 9/1/2005

2" Brass Disc

Stamping: S.J.CO. TU-31.3 1977
Center Mark: Punch

Location:

Exit Roth Road from I-5. Go west 0.05 miles to Manthey Road. Go 0.2 miles south to Manila Road. Monument is located near the intersection of Manthey Road and Manila Road. Found in east curb 10 feet southerly of the centerline prolongation of Manila Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°51'06.77238"N

Longitude: 121°17'00.41677"W

Ellipse Height (m): -26.764

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	650,321.979	2,133,598.03
Easting:	1,931,055.146	6,335,470.09
Combined Factor:	0.9999349	

NAVD88 Elevation (MSL)

Meters	Feet
5.27	17.28

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1004**
Point Name: **BROOK**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: BROOK

Center Mark: Triangle w/Punch

Location:

Exit Roth Road from I-5. Take Roth Road west 0.05 miles to Manthey Road. Go south on Manthey Road 0.2 miles to Manila Road. Take Manila Road west 1.5 miles to private gate at the end of the county portion of Manila Road. The monument was set 34 feet northerly of centerline of Manila Road, 12 feet northerly and 7 feet easterly of a brick pilastar.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°51'06.88804"N

Longitude: 121°18'36.07305"W

Ellipse Height (m):	-28.984

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.013

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	650,345.452	2,133,675.04
Easting:	1,928,716.924	6,327,798.78
Combined Factor:	0.9999353	

NAVD88 Elevation (MSL)

Meters	Feet
3.08	10.10

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1005**
Point Name: **LOGAN**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: LOGAN

Center Mark: Triangle w/Punch

Location:

Exit Roth Road from I-5. Go west 0.05 miles to Manthey Road. Go south 0.4 miles to Frewert Road. Go west on Frewert Road 1.8 miles to end of county portion of Frewert Road. Then follow private road 0.1 miles to top of levee, veer right and head northerly along levee 100 feet to gate. Monument is located along levee 47 feet north of gate

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°51'00.42708"N

Longitude: 121°19'12.48230"W

Ellipse Height (m): -23.772

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.013

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	650,154.024	2,133,046.99
Easting:	1,927,825.182	6,324,873.12
Combined Factor:	0.9999344	

NAVD88 Elevation (MSL)

Meters	Feet
8.31	27.25

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1006**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Pin

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Roth Road from I-5. Go west 0.05 miles to Manthey Road. Take Manthey Road south 0.4 miles to the intersection of Manthey Road and Frewert Road. Monument is located at centerline prolongation of Frewart Road on the east side of Manthey Road 1 foot westerly from fence line along Manthey Road and 1 foot easterly from the most easterly edge of pavement.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'53.52026"N

Longitude: 121°17'03.32326"W

Ellipse Height (m): -26.538

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.014

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	649,914.034	2,132,259.63
Easting:	1,930,980.675	6,335,225.76
Combined Factor:	0.9999348	

NAVD88 Elevation (MSL)

Meters	Feet
5.50	18.04

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1007**
Point Name: **AUNDREA**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: AUNDREA

Center Mark: Triangle w/Punch

Location:

Exit Lathrop Road from I-5. Go east on Lathrop Road for approximately 0 .1 miles to Harlan Road. Go north on Harlan Road for 1.5 miles to 11900 Harlan Road. Westerly from the most southerly driveway, monument set on the westerly side of Harlan Road 2.5' west of the face of curb 60 feet north of signpost and 130 feet south of power pole 8/15.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'52.15811"N

Longitude: 121°17'00.53818"W

Ellipse Height (m):	-26.402

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.014

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	649,871.471	2,132,119.98
Easting:	1,931,048.406	6,335,447.98
Combined Factor:	0.9999347	

NAVD88 Elevation (MSL)

Meters	Feet
5.64	18.49

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1008**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Pin in Concrete

Stamping:

Center Mark: Apparent Center

Location:

Exit Roth Road from I-5. Go west 0.05 miles to Manthey Road Take Manthey Road south approximately 0.6 mile to Klo Road. Monument is located near intersection of Manthey Road and Klo Road. Found 20 feet north of centerline prolongation of Klo Road and 5 feet east of edge of pavement of Manthey Road

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'41.43122"N

Longitude: 121°17'06.15668"W

Ellipse Height (m):	-27.008

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	649,541.930	2,131,038.81
Easting:	1,930,908.284	6,334,988.26
Combined Factor:	0.9999348	

NAVD88 Elevation (MSL)

Meters	Feet
5.04	16.53

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1009**
Point Name: **SLATE**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: SLATE

Center Mark: Triangle w/Punch

Location:

Exit Lathrop Road from I-5. Go east on Lathrop Road for approximately 0 .1 miles to Harlan Road. Head north 1.0 miles to Slate Street. Monument is located near the intersection of Slate Street and Harlan Road. Monument is 43 feet southerly of centerline prolongation of Slate Street at the midpoint between a speed limit sign and directional sign, 2 feet easterly from freeway right of way fence line, 2.5 feet westerly of curb

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'26.99081"N

Longitude: 121°17'06.36910"W

Ellipse Height (m):	-26.731

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	649,096.800	2,129,578.42
Easting:	1,930,899.356	6,334,958.97
Combined Factor:	0.9999346	

NAVD88 Elevation (MSL)

Meters	Feet
5.32	17.46

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1010**
Point Name: **DELIMA**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: DELIMA

Center Mark: Triangle w/Punch

Location:

Exit Lathrop Road from I-5. Go 0.05 miles west on Lathrop Road to Manthey Road. From Manthey Road go north 0.5 miles to De Lima Road. Go west 0.7 miles on De Lima Road to the gate with the " Dead End" sign. The monument is set 3 feet southerly of the most southerly edge of pavement and 8 feet easterly of the gate.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'06.12391"N

Longitude: 121°18'03.64972"W

Ellipse Height (m):	-28.862

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	648,465.378	2,127,506.83
Easting:	1,929,493.456	6,330,346.45
Combined Factor:	0.9999348	

NAVD88 Elevation (MSL)

Meters	Feet
3.22	10.56

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1011**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Pin in Concrete

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Roth Road from I-5. Go 0.05 miles west to Manthey Road. From Manthey Road go north 0.5 miles to De Lima Road. Monument is located 10 feet southerly of the centerline prolongation of De Lima Road, 2 feet westerly from right-of-way fence line on the east side of Manthey Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'06.28658"N

Longitude: 121°17'14.51344"W

Ellipse Height (m):	-27.629

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	648,460.197	2,127,489.83
Easting:	1,930,694.873	6,334,288.10
Combined Factor:	0.9999346	

NAVD88 Elevation (MSL)

Meters	Feet
4.44	14.56

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1012**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: Illegible
Center Mark:

Location:

Exit Lathrop Road from I-5. Go east on Lathrop Road for 0.1 mile to Harlan Road. Go north 1.0 miles to Slate Street. Go east 0.5 miles on Slate Street to intersection of Kirkwood Avenue and Slate Street. Monument is located at centerline intersection of Kirkwood Avenue and Slate Street.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°50'15.73736"N

Longitude: 121°16'43.27217"W

Ellipse Height (m): -27.666

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	648,745.157	2,128,424.74
Easting:	1,931,461.143	6,336,802.10
Combined Factor:	0.9999347	

NAVD88 Elevation (MSL)

Meters	Feet
4.38	14.39

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1013**
Point Name: **PAT**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: PAT

Center Mark: Triangle w/Punch

Location:

Exit Lathrop Road from I-5. Go west on Lathrop Road 0.05 miles to Manthey Road. Go north on Manthey Road 0.3 miles to Dos Reis Road, then west on Dos Reis Road 1.2 miles to Dos Reis Road Park and top of levee. Monument is located 105 feet southerly of the centerline of Dos Reis Road, 7 feet south of metal gate at the top of levee.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'47.35559"N

Longitude: 121°18'38.98683"W

Ellipse Height (m):	-23.353

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,894.226	2,125,632.97
Easting:	1,928,624.456	6,327,495.40
Combined Factor:	0.9999338	

NAVD88 Elevation (MSL)

Meters	Feet
8.75	28.70

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1014**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Pin in Concrete

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Lathrop Road from I-5. Go west on Lathrop Road 0.05 miles to Manthey Road. Go north on Manthey Road 0.3 miles to Dos Reis Road. Monument is located near the intersection of Manthey Road and Dos Reis Road. Found 115 feet south of the centerline prolongation of Dos Reis Road, 1.5 feet westerly of the freeway right-of-way fence line on the east side of Manthey Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'47.65983"N

Longitude: 121°17'21.19674"W

Ellipse Height (m): -27.497

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,887.344	2,125,610.39
Easting:	1,930,526.625	6,333,736.10
Combined Factor:	0.9999344	

NAVD88 Elevation (MSL)

Meters	Feet
4.58	15.03

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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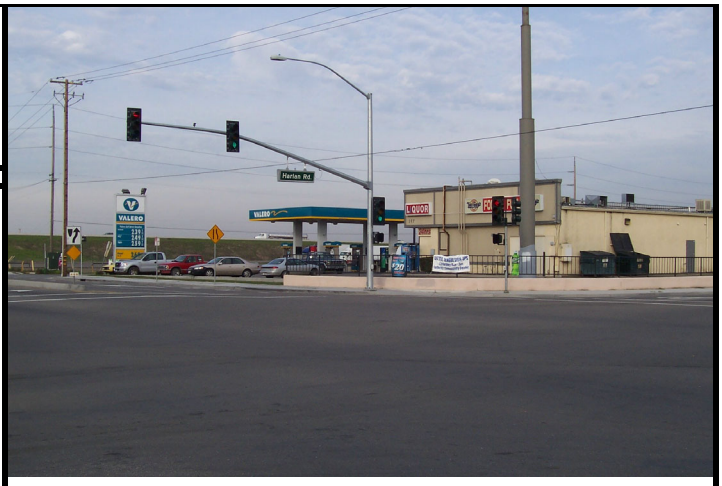
BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1015**
Point Name:



Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: LS 5816
Center Mark: Punch

Location:

Exit Lathrop Road from I-5. Go east on Lathrop Road 0.1 miles to the intersection of Lathrop Road and Harlan Road. Monument is located at the centerline intersection of Lathrop Road and Harlan Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'34.83567"N

Longitude: 121°17'12.81178"W

Ellipse Height (m):	-26.381

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,490.272	2,124,307.67
Easting:	1,930,728.326	6,334,397.85
Combined Factor:	0.9999342	

NAVD88 Elevation (MSL)

Meters	Feet
5.70	18.70

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1016**
Point Name:

Monument Description: Found Date: 9/1/2005

3/4" IP w/ plug/tack in Well Monument

Stamping: L.S. 5840
Center Mark: Tack

Location:

Exit Lathrop Road from I-5. Go east 0.1 miles to Harlan Road. Go north on Harlan Road 0.2 miles to Shilling Avenue. Go 0.3 miles east on Shilling Avenue to Cedar Valley Drive. Monument is located at centerline intersection of Cedar Valley Drive and Shilling Avenue.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'46.46212"N

Longitude: 121°16'51.79241"W

Ellipse Height (m):	-26.978

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,844.389	2,125,469.47
Easting:	1,931,245.299	6,336,093.95
Combined Factor:	0.9999343	

NAVD88 Elevation (MSL)

Meters	Feet
5.09	16.70

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1017**
Point Name:

Monument Description: Found Date: 9/1/2005

1" IP w/ plug/tack in Well Monument

Stamping: LS 5340
Center Mark: Tack

Location:

Exit Lathrop Road from I-5. Take Lathrop Road 0.6 miles east to Woodfield Drive. Take Woodfield Drive 0.1 miles north to intersection of Woodfield Drive and Long Barn Drive. Monument is located at the centerline intersection of Woodfield Drive and Long Barn Drive.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'39.53877"N

Longitude: 121°16'41.54557"W

Ellipse Height (m):	-27.019

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,628.867	2,124,762.37
Easting:	1,931,494.077	6,336,910.15
Combined Factor:	0.9999343	

NAVD88 Elevation (MSL)

Meters	Feet
5.05	16.57

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1018**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: LS 6314
Center Mark: Punch

Location:

Exit Lathrop Road from I-5. Take Lathrop Road 1.4 miles to railroad overcrossing. Monument is located in a 4 foot wide median on Lathrop Road 87 feet west of the westerly edge of bridge deck

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'34.64512"N

Longitude: 121°15'48.60940"W

Ellipse Height (m): -15.544

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	647,467.342	2,124,232.44
Easting:	1,932,787.260	6,341,152.87
Combined Factor:	0.9999325	

NAVD88 Elevation (MSL)

Meters	Feet
16.51	54.16

FGDC Network Accuracy: 0.005

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1019**
Point Name:

Monument Description: Found Date: 9/1/2005

3/4" Pin

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Lathrop Road for I-5. Go west on Lathrop Road 0.05 miles to Manthey Road. Go 0.5 miles south on Manthey Road. Monument is located on the easterly side of Manthey Road, 75 feet north of a private driveway on west side of road, 8 feet north of power pole, 5 feet east of edge of pavement, and 1 foot west of freeway right-of-way fenceline.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'08.89823"N

Longitude: 121°17'35.93790"W

Ellipse Height (m): -27.538

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,695.442	2,121,699.96
Easting:	1,930,156.051	6,332,520.31
Combined Factor:	0.9999342	

NAVD88 Elevation (MSL)

Meters	Feet
4.56	14.97

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1020**
Point Name:

Monument Description: Found Date: 9/1/2005

1 1/2" Disk in Well Monument

Stamping: S.J.C.O. Re 11988
Center Mark: Punch

Location:

Exit Louise Avenue from I-5. Go east 0.1 miles to Harlan Road. Go north on Harlan Road 0.6 miles to Thomsen Road. Go east on Thomsen Road 0.1 miles to Lisa Lane. Monument is located 13 feet east of centerline intersection of Thomsen Road and Lisa Lane on the centerline of Thomsen Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'08.66922"N

Longitude: 121°17'24.35332"W

Ellipse Height (m):	-27.358

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,656.986	2,121,668.94
Easting:	1,930,439.293	6,333,449.58
Combined Factor:	0.9999342	

NAVD88 Elevation (MSL)

Meters	Feet
4.74	15.55

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1021**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Rebar in Well Monument

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Louise Avenue from I-5. Go east on Louise Avenue 0.1 miles to Harlan Road. Go north on Harlan Road 0.6 miles to Thomsen Road. Go east on Thomsen Road 0.4 miles to Cambridge Drive. Go north on Cambridge Drive 0.1 miles to Steven Place. Monument is located at centerline intersection of Cambridge Drive and Steven Place.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'11.26107"N

Longitude: 121°17'03.83326"W

Ellipse Height (m):	-26.374

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,761.666	2,121,917.23
Easting:	1,930,941.784	6,335,098.17
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
5.72	18.75

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1022**
Point Name: **JAMES**

Monument Description: Set Date: 9/1/2005

2" Disk on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: JAMES

Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go east on Louise Avenue 0.1 miles to Harlan Road. Go north on Harlan Road 0.6 miles to Thomsen Road. Go north on Thomsen Road 0.8 miles to 7th Street. Monument is located 40 feet southeasterly of centerline intersection of 7th Street and Thomsen Road, on the east side of 7th Street, 40 feet south from electrical pole, 5 feet west from fence line, and 5 feet east from edge of pavement.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'07.15908"N

Longitude: 121°16'31.99972"W

Ellipse Height (m):	-25.997

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,628.721	2,121,481.06
Easting:	1,931,719.223	6,337,648.82
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
6.08	19.96

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1023**
Point Name: **PARADISE**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: PARADISE

Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Go south on Manthey Road 2.1 miles to Stewart Road. Go westerly on Stewart Road 1.1 miles to Cohen Road. Go northerly and westerly on Cohen Road 2.7 miles to Paradise Avenue. Go south 0.5 miles to Stewart Road. Monument is located 80 feet southeasterly of the centerline intersection, 13 feet northerly of top edge of bank and 10 feet southerly of most southerly edge of pavement.

NAD 83 Coordinates, Epoch 2004.00

Survey by:	RBF	Date:	NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'34.37634"N

Longitude: 121°21'25.24144"W

Ellipse Height (m):	-28.813

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,680.650	2,118,370.60
Easting:	1,924,538.678	6,314,090.65
Combined Factor:	0.9999342	

NAVD88 Elevation (MSL)

Meters	Feet
3.37	11.04

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by:	RBF	Date:	NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1024**
Point Name:

Monument Description: Found Date: 9/1/2005

3" USC&GS Brass Disc in Concrete2.5" Brass Disc

Stamping: LS 5412

Center Mark: Punch

Location:

Exit Louise Avenue from I-5. Go west for 0.6 miles to McKee Boulevard. Head north 0.2 miles to Barbara Terry Boulevard. Monument is located at the centerline intersection of Mckee Boulevard and Barbara Terry Boulevard.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'52.97666"N

Longitude: 121°18'27.06288"W

Ellipse Height (m):	-28.945

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,215.305	2,120,124.71
Easting:	1,928,901.549	6,328,404.50
Combined Factor:	0.9999343	

NAVD88 Elevation (MSL)

Meters	Feet
3.18	10.42

FGDC Network Accuracy: 0.005

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1025**
Point Name:

Monument Description: Found Date: 9/1/2005

3/4" IP with Plastic Plug in Well Monument

Stamping: L84876
Center Mark: Tack

Location:

Exit Louise Avenue from I-5. Go 0.1 miles east to Harlan Road. Go north on Harlan Road 0.3 miles to Camelback Drive. Go east on Camelback Drive 150 feet to intersection with Sedona Lane. Monument is located at the centerline intersection of Camelback Drive and Sedona Lane.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'52.00773"N

Longitude: 121°17'35.06802"W

Ellipse Height (m): -27.171

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,174.560	2,119,991.04
Easting:	1,930,172.911	6,332,575.63
Combined Factor:	0.9999341	

NAVD88 Elevation (MSL)

Meters	Feet
4.94	16.19

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1026**
Point Name:

Monument Description: Found Date: 9/1/2005

2" Disc found in curb

Stamping: B.M. L.S. 4450
Center Mark:

Location:

Exit Louise Avenue from I-5. Go east on Louise approximately 0.7 miles to 5th Street/ Howland Road. Monument is located at the southwest corner of intersection of Louise Avenue and 5th Street/ Howland Road, in the curb, 4 feet east of a traffic signal pole at the west edge of the handicap ramp

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'42.01592"N

Longitude: 121°16'39.47888"W

Ellipse Height (m):	-25.277

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,855.122	2,118,943.01
Easting:	1,931,529.877	6,337,027.61
Combined Factor:	0.9999337	

NAVD88 Elevation (MSL)

Meters	Feet
6.82	22.37

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1027**
Point Name: **BRYCE**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: BRYCE

Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go east on Louise 1.5 miles to the Southern Pacific Railroad Company tracks. Monument is located on south side of Louise Avenue, 10 feet west of railroad tracks and 20 feet south of railroad crossing arms. DESTROYED

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'42.32549"N

Longitude: 121°15'43.52589"W

Ellipse Height (m):	-24.507

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.014

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,853.408	2,118,937.39
Easting:	1,932,898.432	6,341,517.61
Combined Factor:	0.9999336	

NAVD88 Elevation (MSL)

Meters	Feet
7.54	24.75

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1028**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: LS 5412
Center Mark: Punch

Location:

Exit Louise Avenue from I-5. Go west on Louise Avenue for 0.6 miles to McKee Boulevard. Monument is located at the centerline intersection of River Island Parkway and Mckee Boulevard.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'39.78852"N

Longitude: 121°18'23.84896"W

Ellipse Height (m): -27.994

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,808.062	2,118,788.62
Easting:	1,928,976.646	6,328,650.88
Combined Factor:	0.9999341	

NAVD88 Elevation (MSL)

Meters	Feet
4.13	13.56

FGDC Network Accuracy: 0.005

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1029**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: LS5412
Center Mark:

Location:

Exit Louise Avenue from I-5. Go west 0.6 miles to McKee Boulevard. Go south on McKee Boulevard 0.2 miles to Johnson Ferry Boulevard. Go west 0.1 miles to Gold Nugget Trail. Monument is located at the centerline intersection of Johnson Ferry Boulevard and Gold Nugget Trail.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'26.11209"N

Longitude: 121°18'23.13922"W

Ellipse Height (m): -27.718

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,386.295	2,117,404.87
Easting:	1,928,990.372	6,328,695.91
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
4.41	14.48

FGDC Network Accuracy: 0.005

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1030**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Pin in Concrete

Stamping: N/A
Center Mark: Apparent Center

Location:

Exit Louise Avenue from I-5. Go west on Louise Avenue 0.05 miles Manthey Road. Go 0.2 miles south on Manthey Road. Monument is located on the east side of Manthey Road, 5 feet west of freeway right-of-way fence, and 3 feet east of "Stop Ahead" sign

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'27.69311"N

Longitude: 121°17'51.13959"W

Ellipse Height (m): -27.694

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,428.327	2,117,542.77
Easting:	1,929,773.466	6,331,265.11
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
4.43	14.53

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1031**
Point Name:

Monument Description: Found Date: 9/1/2005

1/2" Pin Mushroomed on Top

Stamping: N/A
Center Mark: Cross

Location:

Exit Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Take Manthey Road south 0.8 miles to Brookhurst Boulevard. Go west on Brookhurst Boulevard 0.2 miles to McKee Boulevard. Go north on McKee Boulevard 0.3 miles to a roundabout at Towne Centre Drive. Go west on Towne Centre Drive 0.4 miles to a dead end and an access road to the levee. Go south along the levee access road 0.1 mile to the top of the levee. Monument is located 100 feet north of an outfall structure and 60 feet south of the access road on the westerly side of the levee.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'11.50820"N

Longitude: 121°18'43.29956"W

Ellipse Height (m): -22.679

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,940.350	2,115,941.80
Easting:	1,928,493.364	6,327,065.31
Combined Factor:	0.9999331	

NAVD88 Elevation (MSL)

Meters	Feet
9.47	31.05

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1032**
Point Name: **CITY HALL**

Monument Description: Set Date: 9/1/2005

2" Disc in Concrete

Stamping: CITY HALL
Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Take Manthey Road south 0.8 miles to Brookhurst Boulevard. Go west on Brookhurst Boulevard 0.2 miles to McKee Boulevard. Go north on McKee Boulevard 0.3 miles to Lathrop City Hall on the south side of McKee Boulevard. Monument is located at the northwest corner of concrete base of the flag pole at the southwest side of the City Hall building, 23 feet east from face of curb.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'13.91314"N

Longitude: 121°18'15.78392"W

Ellipse Height (m): -28.856

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,008.677	2,116,165.97
Easting:	1,929,167.043	6,329,275.54
Combined Factor:	0.9999341	

NAVD88 Elevation (MSL)

Meters	Feet
3.28	10.76

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1033**
Point Name:

Monument Description: Found Date: 9/1/2005

1" Rebar w/ Cap/ Tack in Well Monument

Stamping: RCE 24XX
Center Mark: Tack

Location:

Exit Louise Road from I-5. Go 0.2 miles west to Harlan Road. Go south on Harlan Road 0.7 miles to D'arcy Parkway. Monument is located at the centerline intersection of Harlan Road and D'Arcy Parkway.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'12.76836"N

Longitude: 121°17'52.32725"W

Ellipse Height (m):	-28.441

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,968.474	2,116,034.07
Easting:	1,929,740.495	6,331,156.94
Combined Factor:	0.9999341	

NAVD88 Elevation (MSL)

Meters	Feet
3.69	12.10

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1034**
Point Name:

Monument Description: Found Date: 9/1/2005

1/2" Rebar

Stamping: N/A
Center Mark: N/A

Location:

Exit Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Go South on Manthey Road 0.8 miles to Brookhurst Boulevard. Monument is located 4 feet south of centerline prolongation of Brookhurst Boulevard, 2 feet east of freeway right-of-way fence, and 8 feet east of the edge of pavement.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'57.73094"N

Longitude: 121°18'01.49807"W

Ellipse Height (m):	-28.527

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.011

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,506.816	2,114,519.45
Easting:	1,929,512.209	6,330,407.97
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
3.61	11.85

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1035**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: Illegible
Center Mark:

Location:

Exit Louise Road from I-5. Go east 0.2 miles to Harlan Road. Take Harlan Road south 1.3 miles till it dead ends at the entrance to The Home Depot Factory Center. Monument is located at the center of the cul-de-sac

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'39.35303"N

Longitude: 121°17'59.90853"W

Ellipse Height (m):	-26.375

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	643,939.929	2,112,659.59
Easting:	1,929,546.249	6,330,519.65
Combined Factor:	0.9999336	

NAVD88 Elevation (MSL)

Meters	Feet
5.77	18.93

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

RBF CONSULTING

RBF Consulting
JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1036**
Point Name:

Monument Description: Found Date: 9/1/2005

2 1/2" Brass Disc in Well Monument

Stamping: LS 6369
Center Mark: Punch

Location:

Exit Louise Avenue from I-5. Go east on Louise Road 0.2 miles to Harlan Road. Go south on Harlan Road 1.0 miles to Nestle Way. Go east on Nestle Way 0.5 miles. Monument is located on the centerline of Nestle Way 300 feet east of the railroad tracks at the beginning of curve, 50 feet northeasterly of light pole no. 690, and 27 feet south of railroad crossing sign at Building 601.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'49.07716"N

Longitude: 121°17'23.16068"W

Ellipse Height (m): -28.694

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,232.069	2,113,618.05
Easting:	1,930,447.753	6,333,477.34
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
3.44	11.28

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1037**
Point Name:

Monument Description: Found Date: 9/1/2005

2 1/2" Brass Disc in Well Monument

Stamping: PLS 6173
Center Mark: Punch

Location:

Exit Lathrop Road from I-5. Go east on Lathrop Road for approximately 0.2 miles to Harlan Road. Take Harlan Road 0.7 miles to D'Arcy Parkway. Head east on D'Arcy Parkway 1.0 miles to the railroad tracks. Monument is located 280 feet southeasterly of tracks at apparent centerline intersection of D'Arcy Parkway and a future cross street.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'48.54669"N

Longitude: 121°16'45.33658"W

Ellipse Height (m):	-22.944

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,207.959	2,113,538.95
Easting:	1,931,372.886	6,336,512.54
Combined Factor:	0.9999331	

NAVD88 Elevation (MSL)

Meters	Feet
9.18	30.10

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1038**
Point Name:

Monument Description: Found Date: 9/1/2005

2.5" Brass Disc in Well Monument

Stamping: LS 5182 2001
Center Mark:

Location:

Exit Louise Avenue from I-5. Go east 1.2 miles on Louise Avenue to McKinley Road. Go south on McKinley Road 1.0 miles to Yosemite Avenue East. Go east on Yosemite Avenue 0.2 miles to Shideler Parkway. Monument is located at the centerline intersection of Yosemite Avenue and Shideler Parkway.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'50.32860"N

Longitude: 121°15'59.09949"W

Ellipse Height (m): -24.652

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	644,253.551	2,113,688.53
Easting:	1,932,504.411	6,340,224.89
Combined Factor:	0.9999334	

NAVD88 Elevation (MSL)

Meters	Feet
7.45	24.45

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1039**
Point Name: **CLAIRE**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: CLAIRE

Center Mark: Triangle w/Punch

Location:

Eixt Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Go south 2.0 miles to stewart Road. Go westerly on Stewart road for 1.1 miles to Cohen Road. Monument is located at the northwest corner of intersection, 50 feet south of the southeast corner of fence surrounding equipment yard and 90 feet easterly of power pole 1235. DESTORYED

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'24.46629"N

Longitude: 121°19'19.84760"W

Ellipse Height (m): -26.871

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.012

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	643,497.951	2,111,209.53
Easting:	1,927,586.647	6,324,090.52
Combined Factor:	0.9999336	

NAVD88 Elevation (MSL)

Meters	Feet
5.26	17.26

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1040**
Point Name: **LAUNCH**

Monument Description: Set Date: 9/1/2005

2" Disc in Concrete Headwall

Stamping: LAUNCH
Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go west 0.05 miles to Manthey Road. Go south on Manthey Road 1.7 miles to Mossdale Crossing Park and Launch Facility. Enter the park and go to the boat launch ramp. The monument is located in the concrete headwall at the top of the boat launch ramp.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'12.66513"N

Longitude: 121°18'24.24356"W

Ellipse Height (m): -21.930

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.010

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	643,122.307	2,109,977.10
Easting:	1,928,943.842	6,328,543.26
Combined Factor:	0.9999328	

NAVD88 Elevation (MSL)

Meters	Feet
10.23	33.56

FGDC Network Accuracy: 0.007

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **1041**
Point Name: **TRISHA**

Monument Description: Set Date: 9/1/2005

2" Disc on Red Polyroc Monument Block with 24" Feno Anchor

Stamping: TRISHA

Center Mark: Triangle w/Punch

Location:

Exit Louise Avenue from I-5. Go west on Louise Avenue 0.05 miles to Manthey Road. Go South on Manthey Road 1.5 miles. Monument is located about 500 feet north of railroad track bridge, 2 feet west of fence line on the east side of Manthey Road, 65 feet south of pole 541P and driveway at 18570 Manthey Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°47'25.47510"N

Longitude: 121°18'08.48489"W

Ellipse Height (m):	-26.336

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.008

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	643,513.897	2,111,261.85
Easting:	1,929,332.775	6,329,819.28
Combined Factor:	0.9999335	

NAVD88 Elevation (MSL)

Meters	Feet
5.82	19.08

FGDC Network Accuracy: 0.005

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **2004**
Point Name:

Monument Description: Found Date: 9/1/2005

3.75" USC&GS Brass Disc

Stamping: E799 1946
Center Mark: Cross

Location:

Exit Lathrop Road of I-5. Go east on Lathrop Road approximately 1.5 miles. Turn right onto dirt road after you go over the Southern Pacific Railroad Company tracks. Follow road to "T" into the Railroad tracks and canal. Make a left and follow that dirt road parallel with the canal. Stay to the left approximately 0.4 miles till you can cross over tracks and canal. Make a right after crossing over and head northwest for 100 feet. Monument is located on canal headwall

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°49'17.58024"N

Longitude: 121°15'44.34594"W

Ellipse Height (m): -25.607

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.006

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	646,940.412	2,122,503.67
Easting:	1,932,887.228	6,341,480.85
Combined Factor:	0.9999340	

NAVD88 Elevation (MSL)

Meters	Feet
6.45	21.17

FGDC Network Accuracy: 0.000

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **2006**
Point Name: **MATHEW**

Monument Description: Found Date: 9/1/2005

3" USC&GS Brass Disc

Stamping: MATHEW 1959
Center Mark: Cross

Location:

Exit Mathews Road from I-5. Go west on Mathews Road 0.6 miles to the San Joaquin County Juvenile Justice Center located at 535 Mathews. Monument is located 50 feet west of a fire hydrant, and 10 feet north of edge of road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°52'56.96453"N
Longitude: 121°17'22.47728"W
Ellipse Height (m): -26.920

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.007
+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	653,723.564	2,144,758.06
Easting:	1,930,544.553	6,333,794.92
Combined Factor:	0.9999360	

NAVD88 Elevation (MSL)

Meters	Feet
5.06	16.60

FGDC Network Accuracy: 0.000
+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **2024**
Point Name: **TIDAL 6**

Monument Description: Found Date: 9/1/2005

3" USC&GS Brass Disc in Concrete

Stamping: NO. 6 1949 Reset 1958
Center Mark: Cross

Location:

Exit Louise Avenue from I-5. Go west on Louise Avenue 0.05 to Manthey Road. Take Manthey Road south 2.1 miles to Stewart Road. Go westerly on Stewart Road 1.1 miles to Cohen Road. Go notherly and westerly on Cohen Road 1.7 miles. Monument is located 10 feet northerly of the edge of the pavement on a 7'x 7' concrete slap for a 20" standpipe.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°48'30.43221"N

Longitude: 121°20'06.10028"W

Ellipse Height (m): -26.297

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.005
+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	645,541.561	2,117,914.27
Easting:	1,926,473.239	6,320,437.62
Combined Factor:	0.9999338	

NAVD88 Elevation (MSL)

Meters	Feet
5.86	19.23

FGDC Network Accuracy: 0.000
+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

BENCH MARK MONUMENT REPORT
CITY OF LATHROP

Date Printed: 5/5/2006

Point ID: **2025**
Point Name:

Monument Description: Found Date: 9/1/2005

3.75" USC & GS Brass Disk

Stamping: USC & GS H1041 1959
Center Mark: Cross

Location:

Exit Louise Avenue from I-5. Go west on Louise Avenue 0.05 to Manthey Road. Take Manthey Road 3.3 miles to a concrete bridge. Monument is located at the northeast concrete bridge abuttment on Manthey Road.

NAD 83 Coordinates, Epoch 2004.00

Survey by: RBF Date: NOV 2005

Ellipsoidal Coordinates, GRS 80

Latitude: 37°46'18.66517"N

Longitude: 121°19'34.71494"W

Ellipse Height (m): -23.890

Calif. Coord. System of 1983(Epoch 2004.00) Zone 3

FGDC Network Accuracy: 0.009

+/- Meters at 95% Confidence

	Meters	US Survey Feet
Northing:	641,472.650	2,104,564.85
Easting:	1,927,205.012	6,322,838.44
Combined Factor:	0.9999330	

NAVD88 Elevation (MSL)

Meters	Feet
8.31	27.25

FGDC Network Accuracy: 0.000

+/- Meters at 95% Confidence

Survey by: RBF Date: NOV 2005

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JN 60-100154

APPENDIX F

RTU/PLC Programming Guildelines for SCADA Interface

RTU/PLC PROGRAMMING GUIDELINES FOR SCADA INTERFACE

1. Introduction

This document is intended to guide programming of programmable logic controllers (PLCs) for interface with the City of Lathrop's supervisory control and data acquisition (SCADA) system. This guideline applies to PLCs controlling domestic water, recycled water, storm water and wastewater facilities throughout the city. All of these sites will be integrated into a radio telemetry system headed by two master PLCs at Corporation Yard and City Hall.

2. Revision History

The table below shows the history of revisions to this document.

Rev.	Description	By	Date
Draft	Issued to City for comment	MCC – MH	19-Jan-05

3. Hardware

Modicon PLCs equipped with Ethernet (Modbus/TCP) ports will be used at all sites. Locus Ethernet radios are used to create a citywide control network. Internet Protocol (IP) addresses must be assigned correctly to avoid duplicate addresses in the network.

3.1 IP Addressing

IP addresses will be assigned based on the type of site the PLC controls, the number of the site, and the type of device. The IP addressing scheme is based on a private Class B address space. The subnet mask for all devices is 255.255.0.0.

First Octet	Second Octet	Third Octet				Fourth Octet
172 for all	*16 for all*	*First 2 digits = Site Type*		*Last digit = Device Type*		*Site Number*
		10	Master Control	0	Radio	
		11	Water Well	1	PLC	
		12	Water Booster	2	Operator Interface (OIT)	
		13	Waste Water	3	SCADA Server	
		14	Recycled Water	4	Programming PC	
		15	Storm Water	5	SCADA Client	
				6	Printer	

An example of how this scheme is applied appears below:

Device	IP Address
Well 21 Radio	172.16.110.21
Well 21 PLC	172.16.111.21
Well 21 OIT	172.16.112.21
Corporation Yard Radio	172.16.100.1
Corporation Yard PLC	172.16.101.1
Corporation Yard SCADA	172.16.103.1

4. Data Tables

PLC data tables must be programmed to allow for efficient communication with the master PLCs at Corporation Yard and City Hall. Many sites feature local operator interface terminals (OITs) that allow an operator to change set points and modes locally. To avoid conflict between local set point entry and entries made at the SCADA system, each PLC will be programmed with two control modes. In local mode, the set points entered at the OIT will prevail. These set points will be read by the master PLC and the SCADA system will be updated with any new entries made at the site. In SCADA mode, set points written from the master PLC are used for control and the local OIT is updated with the latest entries. One or two pushbuttons are generally provided on the local OIT to allow for local / SCADA mode selection. SCADA mode may also be requested from the SCADA system if an operator leaves a site in local mode. All data that is written or read by the master PLC must be mapped to tightly packed 40xxxx registers. All set points read by the master PLC and all set points written by the master PLC must be contiguous.

4.1 Read Table

For most sites, the read table should consume less than 100 registers. If more than 100 registers are required, multiple read tables may be configured. A typical read table arrangement follows:

Starting Address	Length	Description
400400	1	PLC bits – local mode indicator, handshake bit, etc.
400401	5	Discrete status bits for the process (digital inputs, derived coils, etc.)
400406	4	Discrete Alarm bits
400411	20	Analog process values, flow totals, runtime totals, etc.
400451	3	Momentary pushbuttons echo to master
400454	2	Maintained selectors echo to master
400456	30	Current control and alarm set points

4.2 Write Table

For nearly all sites, the write table should consume less than 100 registers. If more than 100 registers are required, multiple write tables may be configured. A typical write table arrangement follows:

Starting Address	Length	Description
400600	1	PLC bits – local mode indicator, handshake bit, etc.
400601	3	Momentary pushbuttons (Alarm Reset, Start, Total Reset, etc.)
400604	2	Maintained selectors (Auto/Man, etc.)
400606	30	Control and alarm set points from SCADA

5. SCADA Control

An operator at a SCADA terminal should have access to all pertinent control and alarm set points and delays. Where possible, consolidation of delay set points is encouraged so that the number of registers transmitted over the radio network can be reduced. Examples include: the use of a single pump fail delay set point that applies to all pumps at a site; the use of a single level transmitter alarm delay that applies to high, low, very high, very low, and transmitter fail alarms.

Where manual operation will not present a problem with critical interlocks, a manual mode should be provided in which an operator can start or stop a pump on demand. This should be implemented with the use of 3 bits. One of these bits is a maintained auto / manual selector and the other two are momentary start / stop bits.

Where a large number of set points will force the read table over 100 registers, decisions may be made to have certain set points only available on the OIT rather than accessible at both OIT and SCADA. Examples of this type of set point might include configuration parameters that will not be frequently accessed such as PID settings.

6. Conclusion

These guidelines are a brief summary of considerations and recommendations for the programming of PLCs that will be part of the City of Lathrop SCADA system. Coordination between the site control system provider and the City's SCADA programmer will be required for final configuration and commissioning. It is recommended that the site control system provider review these guidelines and submit a proposed communication data table layout for review by the City prior to commencing the programming effort.

APPENDIX G

SECURED FACILITIES

1. Introduction

This document is intended to provide guidelines for securing City facilities including recycled water ponds, pump stations, and booster stations.

2. Locking Systems and Security Systems

All of the City facilities mentioned in Section 1 above shall be fitted with Cyberlock locking systems, security systems including cameras, motion detection and monitored 24/7.

2.1 Locks

The new lock system shall be Cyberlock key system manufactured by Videx. The entry door locks shall be schlage setups with a Cyberlock tumbler installed. The padlocks shall be Brinks locks, with the CyberLock tumbler installed in the lock.

2.2 Communication

All of these facilities shall have a secured communication link with a 3DES Encryption at a minimum to these facilities.

2.3 Perimeter Controls

Perimeter controls shall consist of:

a. Security perimeter fencing, or proximity photo with infrared

b. 24-hour monitoring and a Federal crime to tamper with shall be installed on the perimeter fence.

2.4 Access Controls

Access controls shall include:

a. Vandal resistant locks on gates, ladders, fuel storage tans, valve operators, and electrical panels.

b. Vandal resistant gate latch and lock.

c. Ladder lockout/access controls.

d. Vent screens with heavy gauge expanded metal.

2.5 Detection

Detection shall include:

a. Photo infrared motion detectors at each facility connected to exterior lighting.

b. Exterior lighting.

c. Dry contacts on doors, hatches, and access covers.

d. Motion detection on tank ladders.

e. Pan, tilt, zoom (PTZ) color, web-enabled low light CCTV at critical facilities.

f. Recording appliance, security controller, integration software, and ancillary devices.

g. Beacon and horn to intrusion alarms.

2.6 Cyber-Security

Cyber-security shall include:

a. Encrypt data transmissions 3DES at minimum.

b. Password protocols and procedures.

2.7 Policies and Procedures

Policies and procedures shall include:

a. Neighborhood watch program.

b. Remote site entry/alarm notification protocols.

c. Written key control policy.

d. Update emergency response plan to include lock down, shelter-in-place, and VA security recommendations.

e. Emergency isolation, system decontamination, and shut down procedures.

f. Public relations/media policy.

g. Unusual event reporting log.

h. Security awareness training.

i. Passwords Compliance.

APPENDIX H

WASTEWATER AND STORM WATER PUMP STATION CRITERIA

The use of wastewater and storm drainage pumping systems shall be avoided whenever possible. Where such facilities can not be avoided, approval of the City Engineer shall be required. The request shall include documentation demonstrating the need for each proposed facility. All pump stations designs shall be prepared by a Registered California Civil and Electrical Engineer, and approved by City Engineer.

A. Storm Water Pump Station – Specific Design Criteria

1. Station shall be designed to provide for gravity outfall during the summer months and other periods of low water stages. If a low stage gravity outfall is impossible or impractical, an alternate pump of smaller capacity for low stage flow shall be provided.

2. Pumps shall be preceded by trash racks. Pump stations with capacities exceeding 1.0 cfs shall be equipped with mechanically cleaned trash racks. Trash racks shall have 2-inch clear openings between bars and shall be designed so that the velocity through a clean rack does not exceed 1.0 feet per second under any operating conditions. Manually cleaned trash racks shall be designed so that the velocity through a clean rack does not exceed 0.5 feet per second.

3. Pump stations with capacities over 9,000 gpm (20 cfs) shall be equipped with vertical mix flow pumps. Pump motors and controls shall be enclosed in a building that is aesthetically pleasing and architecturally compatible with the surrounding area in residential areas; in non-residential areas, an appropriate enclosure shall be provided (i.e. fence or vault). A bridge crane and adequate work access shall be provided for either open or enclosed pump stations.

4. The backflow of water from a receiving water body shall be prevented by establishing the invert of all discharge pipes above the means high water elevation in the receiving water, and installing an air release/siphon breaker valves at the high point of the discharge end of each discharge pipe. Rubber “Tide Flex” valves mounted on concrete headwalls shall be provided at the discharge end of each discharge pipe.

B. Wastewater Pump station – Specific Design Criteria

1. Odor control facilities shall be provided at pump station and wet well.

2. Paved and concrete areas, after the driveway, shall slope to a drain inlet that is connected to the wet well with a gravity check valve.

3. Structures shall be reinforced concrete, fiberglass, and fusion epoxy coated.

4. A hatch shall be provided suitable for the removal and replacement of major equipment components. Hatches shall be spring loaded (Bilco type) made of stainless steel or aluminum materials an inner safety fall grate.

5. Valve and other vaults shall incorporate an automatic sump pump or 4" gravity drain (slope floor to sump/drain) at option of City Engineer, with check valve in discharge pipe to wet well.

    a. Provide standby pumping capacity equal to the largest single unit.

    b. Sump pumps shall be easily removable for maintenance.

    c. Gravity drain shall be positioned in sump with removable debris grate

6. Provide an emergency shower and eye wash station.

C. General Pump Station Design

1. Pump stations shall design for flow computations in accordance with the latest edition of the "Hydraulic Institute Standards":

2. Submersible lift station shall meet the minimum requirements of "SWPA Handbook, Submersible Sewage Pumping Systems" by Submersible Wastewater Pump Association.

3. Submersible pumps shall be rail mounted with auto disconnect.

4. All pumps shall be capable of passing 3-inch spherical solids. 2" is allowed at the discretion of the City Engineer.

5. Capacity shall be provided for the ultimate peak flow or design storm with the largest pump out of service.

    a. Staged installation is allowed when more than two pumps are required for build-out conditions.

    b. Space shall be provided for future installations. Where slide mount submersible pumps are used, a duplex installation of 100% design capacity may be used if a complete spare pump assembly is supplied to the City.

    c. Where design flows exceed 1.0 cfs, a low flow pump shall be provided in addition to the design rated pumps. The low flow pump shall have a

capacity of 5% to 10% of the design flow and shall operate as the lead pump.

6. Water level control shall be from submersible pressure transducer.

7. High & Low Float Switches

   a. Station shall incorporate a high and low float positioned above and below the normal operating range of the wet well.

   b. Floats shall bypass PLC controls and start or stop two pumps through direct call to the VFDs. Addition pump may be called based on pump station design.

   c. Floats shall initiate all alarm annunciations available to the station through the PLC.

   d. An emergency high level float switch, positioned above the High float switch may be required that annunciates an independent alarm system (separate from the PLC). The need for this additional capability will be at the discretion of the City Engineer.

8. Locks, keyed to the City master system (Cyberlock), shall be provided by the City and paid for by the developer at the entry to the pump station and to the wet well.

9. A lifting loop, pad mount crane or bridge crane over each pump/motor, or similar provisions for removal of the pump(s) shall be provided at the discretion of the City Engineer. Permanent hoists shall be required when removal of larger pumps is otherwise impractical.

10. The well rim and electrical panel shall be 12” above the 200-Year Flood Elevation.

11. Corrosion protection shall be provided at pump station and wet well.

12. Pump curves, operating voltage and phasing, horsepower, etc., shall be in accordance with approved submittal per Section 74-1.01C of the Standard Specifications.

13. Submersible pumps shall be capable of running in air without damage. Moisture sensing circuit breakers in terminal chamber shall be incorporated into submersible pumps.

14. A min NEMA-3 weatherproof enclosure and panels shall be provided. Electric service shall be provided by underground conduit to the utility service pedestal.

15. Programmable Logic Controllers (PLC)

    a. The pump station shall be controlled and connected to the City's Supervisory Control and Data Acquisition (SCADA) system in accordance with the PLC Requirements in Appendix F of these Design and Construction Standards. City contractor will program SCADA.

    b. A standby battery and charger shall be supplied. The battery is to be able to operate the controller for two weeks with the external power source removed.

    c. An adjustable time delay before any restart shall be incorporated which allows delays from 1 to 10 minutes.

    d. Bubbler type controls will not be acceptable.

    e. Switches for manual operation of each pump shall be included.

    f. Pumps shall be equipped with Variable Frequency Drive speed controls of a type approved by the City Engineer.

    g. SCADA shall test for leaks or clogs in the force mains exceeding 100 feet and shall shut off pumps and send SCADA alarm if detected.

16. An automatic telephone dialer and message capability for all alarms shall be installed.

17. Each pump shall have a gate valve and check valve on the discharge piping.

18. Access and work area of pump stations shall be paved with minimum 3" AC on 10" AB, if out-of-doors, and with full concrete floor within a building.

19. An 8-foot high chain link fence with privacy slats per Standard Details or as required by the project UDC, or approved by the Community Development Director, shall be constructed to enclose the pump station. The fence may be omitted on approval of the City Engineer.

20. The pump station shall not be in the City street right-of-way except with permission from the City Engineer.

21. The interior of the structure, all machinery, piping, and exterior above grade shall be painted or epoxy coated.

22. Emergency operation during power outages shall be provided by a diesel powered generator onsite with automatic transfer switch. The generator

shall have the capacity to operate the station at peak loads. The generator shall comply with applicable emission requirements of the local air quality maintenance district.

23. The City shall be provided with three complete sets of manufacturer's brochures, technical data, O&M manuals, schematics, wiring diagrams, etc., for all equipment and controls.

D. Structural Design

1. Structural components shall be designed and constructed in strict conformance with the following codes and standards:

   a. California Building Code (CBC), latest edition

   b. Building Code Requirements for Reinforced Concrete (ACI 318-14) and Commentary (ACI 318R-14)

   c. Manual of Steel Construction Allowable Stress, 14th edition, American Institute of Steel Construction (AISC)

   d. Environmental Engineering Concrete StructuresOccupational Safety and Health Administration (OSHA) Standards

2. All outside exposed surfaces of all structures shall have Tex-Cote Graffiti-Gard®, or approved equal, applied to full height of structure.

3. Wherever required by the City Engineer, due to the size and facility requirements a pump house building is required, the building shall be reinforced masonry block. Access for equipment removal shall be provided without roof or door removal. Removable roof hatches may be considered.

4. All structures in residential areas shall be constructed or installed so as to be aesthetically compatible with the neighboring architecture. Aesthetic treatment and architectural features shall be approved by the Community Development Director.

F. Mechanical and Piping

1. All design shall satisfy the minimum requirements of the State Health Code.

2. A reduced pressure principle backflow prevention device is required on all domestic water connections.

3. A 1" metered connection is to be provided adjacent to the station with a ¾" hose bib on site complete with fabricated steel hose rack and ¾" x 50' industrial grade rubber hose.

4. In hazardous confined spaces, an automatic air blower system is to be provided to exchange air every 6 minutes (minimum). Air blowers shall be easily removable for maintenance.

G. Electrical

1. All electrical installations shall comply with the California Electric Code (CEC), NEMA, and Division of Industrial Safety requirements, County of San Joaquin and City of Lathrop Electrical Code.

2. Enclosed and mounted prefabricated electrical panels shall be used above ground level outside the pump station, where applicable.

3. Running time meters shall be provided for all motors (use reset type),

4. Explosion proof electrical appurtenances shall be provided below ground or an approved type disconnect and time delay shall be provided.

5. Separate blower system shall be provided in all electrical panels located below ground.

6. Adequate lighting and electrical outlets shall be provided outside facility and within buildings and wet wells.

7. Color code and number all wiring, switches, controls, relays, and piping per National Standard Coding.

8. The Developer shall meet all local utility requirements.

9. Where control cabinet is not adjacent to pumps, manual switches and emergency shutoffs shall be provided.

H. Force Main Design

1. Redundant force mains may be required by the City Engineer.

2. Velocity Limits

a. Resuspension initial velocity of a minimum of 3.5 ft/s.

b. Minimum velocity shall be 2 ft/s.

c. Maximum velocity shall be 10 ft/s.

d. Force mains shall be size to maintain a minimum and maximum velocity of 2 and 10 ft/s, respectively. Redundant force mains may be required by the City Engineer.

3. All force mains shall be designed with a storage volume of 24 hours at the pump station or a fully redundant parallel force main.

4. Combination air release/vacuum valves for sewage shall be provided for at all high points in a force main. The combination air release/vacuum valves shall be in accordance with City Standard Details.

5. A means of dewatering the force main(s) shall be provided.

I. All pump stations shall be secured in accordance with the requirements of Appendix G, Secured Facilities.

APPENDIX I

Autocad Digital Submission Standards

AutoCAD Digital Submission Standards

Purpose

The City of Lathrop (City) maintains an ArcGIS 10.x enterprise Geographic Information System (GIS) database to manage all of its Public Works assets including storm, sewer and water lines. The CITY utilizes the local government model from ESRI - http://resources.arcgis.com/content/local-government. This document references the most current CITY requirements and provides technical details such as CAD layering standards. The purpose of this document is ensure the utmost quality of data submitted to the CITY as it is converted into the CITY's enterprise GIS database.

Format Requirements

Consulting Engineer shall submit both hard copies and electronic copies of the "Record Drawings" to the CITY. The two (2) electronic copies shall be submitted on DVD media in both AutoCAD (.dwg) and Adobe Portable Document Format (.pdf) files.

In addition to AutoCAD .dwg files, data may be submitted in ESRI Shapefiles (.shp) or ESRI File Geodatabase if the layer information is retained and referenced. It is also requested that an additional DVD with the Adobe Portable Document (.pdf) and Auto CAD Drawing (.dwg) be sent to the CITY's Information Technologies (IT) department concurrently with the record drawing submission to the Public Works Department. The Public Works department will verify that digital files are included and the IT department will perform the comprehensive digital data review.

CAD Layers

See Table 1 for a complete tabular list of CAD layers which includes the layer name, description and feature type (point, line, text). All lines shall be continuous with no duplicate lines in the same layers. If there are missing features in the "0" layer the developer will be notified of the errors during the review process and will be required to revise the digital drawing file. Correct capitalization and spelling of layer names must be consistent with the layer name table. Consistency in layer names is imperative in the GIS data conversion process as it will eliminate redundant processing steps and potential loss of valuable information. If the consulting engineer is unable to utilize the recommended layering system, we need supplemental documentation matching the layer name used by the consulting engineer to GIS feature type.

Sizes of Lines

It is required that the sizes of the lines for storm, sewer and water pipes be included in the digital CAD .dwg file. There are two options for storing the sizes, either the "Thickness" field in AutoCAD or noted appropriately in the layer name. For example, a six inch water pipe can be noted as EXWTPI-6. If the method of noting sizes in the layer names is used, the notations must be consistent, or they will be noted as errors and be sent to the developer for further revision.

Spatial Reference

The digital drawings must be spatially referenced to California State Plane Zone III Units Feet. The horizontal datum shall be NAD83, vertical datum NAVD88.

Three-Dimensional Information

Currently it is not required that all contents of the as-built drawings be submitted with three-dimensional information. It is recommended but not yet required that sewer, storm and water points contain point elevations. Contour points and monuments shall have the elevation stored in the point, not as a text label. It is recommended that a feature linked table be attached to the points if elevations are not stored within the points. Any issues regarding the procedures or technical constraints should be directed to the CITY.

Digital Data Review

All digital data will be reviewed by the CITY Public Works department and the IT department under the following criteria:

a. Correct layering naming conventions

b. Verification that digital and hardcopy drawings are consistent

c. Correct geographical position (i.e. correct spatial reference)

d. Review of points, lines and polygons and error checking

The developer will be notified if there are errors and a request will be made to correct and resubmit the correct digital file. Failure to resubmit the corrected files will potentially delay approval of project.

Table 1

LAYER NAME	DESCRIPTION	TYPE	Target GIS Layer
BLDG-EX	Existing Building	Polyline	Building Footprints
BLDG-FU	Future Building	Polyline	Building Footprints
BM	Benchmark	Point	Benchmark
BND	Boundary Lines	Continuous-Line	(various)
BND0FU	Future Boundary Lines	Continuous-Line	(various)
BND-EX	Existing Boundary Lines	Dashed-Line	(various)
CANAL	Canal	Continuous-Line	Canal
CTRLPT	Control Point	Point	Control Corners
DW-STR	Street Driveway		Driveway
ELEV	Elevation	Point	Elevations
LL-EX	Existing Lot Lines	Dashed-Line	Owner Parcels
LL-FU	Future Lot Lines	Continuous-Line	Owner Parcels
LTPOLE	Light Pole	Point	Poles
MON	Monuments	Monuments	Monuments
PUE	Easements	Polyline	Encumbrences

LAYER NAME	DESCRIPTION	TYPE	Target GIS Layer
PWCTVA-(#)	Potable Water Control Valves, (#) = diameter	Point	Water Control Valves
PWFIT-CA(#)	Potable Water Fittings-Cap, (#) = diameter	Point	Water Fittings
PWFIT-EJ(#)	Potable Water Fittings- Expansion Joint, (#) = diameter	Point	Water Fittings
PWFIT-RD(#)	Potable Water Fittings- Reducer, (#) = diameter	Point	Water Fittings
PWFIT-UK(#)	Potable Water Fittings- Unknown, (#) = diameter	Point	Water Fittings
PWHY	Potable Water Hydrants	Point	Water Hydrants
PWLA-(#)	Potable Water Laterals, (#) = size	Continuous - Line	Water Laterals
PWMA-(#)	Potable Water Main (#) = diameter	Continuous - Line	Water Mains
PWMA-EX	Existing Potable Water Main	Dashed - Line	Water Mains
PWMT	Potable Water Meter	Point	Water Service Connections
PWPU	Potable Water Pump Station	Point	Water Network Structures
PWPW	Potable Water Production Well	Point	Water Network Structures
PWSS	Potable Water Sampling Station	Point	Water Sampling Stations
PWTA	Potable Water Tanks (Enclosed Storage Facility)	Point	Water Network Structures
PWVA-(#)	Potable Water Valve, (#) - Diameter	Point	Water System Valves
RDCL	Road Centerlines	Continuous-Line	Road Centerlines
RIVER	River	Continous-Line	River
RR	Railroads	Continuous-Line	Railroads
RWPU	Reclaimed Water Pump	Point	Water Network Structures
RWPW	Reclaimed Water Production Well	Point	Water Network Structures
SD-EX	Existing Storm Drain	Dashed-Line	Storm Drain (Existing)
SDFIT-(#)	Storm Drain Fitting, (#) - Diameter	Point	Storm Fittings
SDIN	Storm Inlets - mainly catch basins	Point	Storm Inlets
SDLI	Storm Drain Lift Stations	Point	Storm Network Structures
SDMAFM-(#)	Storm Force Main, (#) - Diameter	Continuous - Line	Storm Pressurized Main
SDMAGV-(#)	Storm Drain Main - Gravity Feed (#) - Diameter	Continuous - Line	Storm Gravity Mains

LAYER NAME	DESCRIPTION	TYPE	Target GIS Layer
SDMH	Storm Drain manhole	Point	Storm Manholes
SDOU	Storm Water Outfall	Point	Storm Discharge Points
SDVA	Storm Drain Valve	Point	Storm System Valves
SN	Street Names	Annotation (Text)	Street Text (Anno)
SSARV	Sewer Air Release Valves	Point	Sewer Control Valves
SSCL	Sewer Clean Outs	Point	Sewer Clean Outs
SSFIT	Sewer Fittings	Point	Sewer Fittings
SSLA	Sewer Lateral Lines	Continuous - Line	Sewer Lateral Lines
SSLI	Sewer Lift Station	Point	Sewer Network Structures
SSMAFM-(#)	Sewer Force Mains, (#) - Diameter	Continuous - Line	Sewer Pressurized Lines
SSMAGV-(#)	Sewer Gravity Lines, (#) - Diameter	Continuous - Line	Sewer Gravity Lines
SSMH	Sewer Manhole	Point	Sewer Manhole
SSTP	Sewer Treatment Plant	Point	Sewer Network Structures
SSVA	Sewer Valves	Point	Sewer System Valves
SSW-EX	Existing Street Sidewalk	Continuous-Line	Sidewalks
SSW-FU	Future Street Sidewalk	Continuous-Line	Sidewalks
CNTR-IND	Contour Index	Continous-Line	Contours
CNTR-IMD	Contour Intermediate	Continous-Line	Contours

(#) - Insert numeric value for diameter/size

APPENDIX J
CLEANING AND CLOSED-CIRCUIT TELEVISION INSPECTION OF SANITARY SEWER AND STORM DRAIN PIPELINES

CLEANING AND CLOSED-CIRCUIT TELEVISION INSPECTION OF SANITARY SEWER AND STORM DRAIN PIPELINES

OBJECTIVE

These specifications define the minimum requirements for the preparatory cleaning and closed-circuit television (CCTV) inspection of new or existing sanitary sewer and storm drainage pipelines, and for required warranty CCTV inspections of pipelines. The purpose of this work will be to determine the condition of the pipeline, document the location of connections and other key features, identify any structural deficiencies, and to locate defects that may be allowing groundwater to infiltrate into the pipeline.

GENERAL

Experienced and pre-qualified personnel utilizing equipment and materials meeting the requirements of these specifications shall perform all work. Pre-qualification shall require that the contracting company and the job supervisor each have a minimum of three (3) years experience in the performance of the type of work specified and shall have specifically performed at least 100,000 feet of cleaning and television inspection within the past three years. A company with less than three (3) years experience may pre-qualify if they can demonstrate to the satisfaction of the City that they have the capabilities and overall experience, equipment and expertise to satisfactorily complete the project in accordance with these specifications.

All work shall be performed to the minimum standards of the industry. Where not conflicting with the requirements of these specifications, the most current available edition of the National Association of Sewer Service Companies (NASSCO) Specifications Guidelines and the NASSCO Inspector Handbook shall be used as a measure of the standard of practice for this work.

The Contractor shall use designated City and standard industry terminology in the performance and documentation of the CCTV inspection work. Pipeline joints, as used within these specifications, refer to the junction of two pipes. The term, “manhole section” as used in these specifications shall mean the length of pipe connecting two manholes or a manhole and a clean-out.

Before final acceptance of the work by the City, the Contractor shall review with the City the findings of the fieldwork to confirm that all necessary work has been performed as needed. This shall include a review of finished written records of defects found, the videotapes, and any sketches or diagrams prepared to illustrate defects found.

ACCESSIBILITY

Due to some site constraints, it is highly recommended that all prospective CCTV Contractors review the project site locations for accessibility. Entry onto private

property without permission is not authorized. Where permission is denied, it shall be the Contractors burden to develop an alternative approach to inspecting the pipeline.

SOUND CONTROL

The noise level from the Contractor's operations, between the hours of 10:00 PM and 7:00 AM, shall not exceed 50 dba at the exterior of any residential unit within 1,000 feet of the Contractor's work. This requirement does not relieve the Contractor of the responsibility for complying with local ordinances regulating noise level.

Said noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transit equipment that may or may not be owned by the Contractor. The use of loud sound signals between the hours of 10:00 PM and 7:00 AM shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

SAFETY

The Contractor shall submit to the City a copy of the Contractor's safety program demonstrating that the Contractor's equipment, methods and procedures meets or exceeds all applicable CAL-OSHA and FED-OSHA regulations, with emphasis on hazard-free confined space entry. When work will be performed on one of the City's major streets or highways, traffic control plans shall be submitted to the City and, when appropriate, Caltrans, prior to commencing work. The Contractor shall obtain approved safety programs and traffic control plans from the City, and Caltrans, when applicable, before proceeding with fieldwork.

PREPARATORY CLEANING

Prior to CCTV work, pipeline(s) shall be cleaned so any cracks or other defects can be observed during the CCTV inspection work. The designated manhole section(s) shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The Contractor shall clean the pipeline with a minimum of two (2) passes of a high-velocity jet-cleaning machine (hydroflusher). Newly constructed pipelines shall be cleaned to remove all foreign materials from the pipelines. Pipelines to be inspected for warranty acceptance shall be cleaned to remove all foreign material. Larger pipelines that may have minor deposits in the barrel shall be cleaned to restore carrying capacity to a minimum of 95% of original. Grease accumulations in sanitary sewer pipelines shall be removed so cracks and breaks can be observed during TV inspection. Cleaning shall be performed before inspection but not more than 48 hours before the CCTV inspection of the pipeline is started. All debris and loose material shall be removed at the next downstream manhole structure, transported to a disposal site and disposed of lawfully.

Sewer hydrocleaning equipment (hydroflusher) of high-velocity type shall be truck or trailer mounted. The equipment shall have a minimum of 500 feet of high-pressure hose with a selection of two or more cleaning nozzles. The equipment shall be capable of supplying water at 60 gallons per minute at a minimum working pressure of 1,200 pounds per square inch (psi), and regulated to not exceed a maximum pressure of 1,500 psi. The nozzles shall be capable of producing a scouring action for any pipeline size scheduled to be cleaned. All controls shall be located so that the equipment can be operated above ground at minimal interference to existing traffic and/or danger to the operator. Due to possible accessibility constraints, additional lengths of high-pressure hose may be required. Where accessibility constraints exist, reduced flow and pressure may be used subject to the approval of the City. However, the performance criteria for cleaning of the manhole section shall remain unchanged.

It is recognized that there are some conditions such as broken pipe and blockages that prevent cleaning from being completed or where additional damage would result if cleaning were attempted or continued. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on another manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it shall be assumed that a major blockage exists, work shall be stopped on the manhole segment in question, and the City shall be immediately notified. Where a broken pipe or a major blockage is suspected, the Contractor shall not proceed with additional cleaning, except at own risk, without the specific written direction of the City.

When hydraulic cleaning equipment is used, the Contractor shall be responsible to plan and control the cleaning operations to prevent flooding of the sewers/storm drains and public or private property. Movable dam type equipment shall be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer/storm drain. Movable dam equipment shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease.

Whenever lines to be cleaned show evidence of being more than one-half filled with solids, bucket machines and rodding machines shall be utilized to remove most of materials before hydraulic equipment is brought into use for finishing the cleaning of the pipeline. The Contractor shall also use bucket machines or rodding machines in instances where severe root intrusion or heavy grease is encountered. Bucket machines shall be operated in pairs with each machine powered by an engine with a minimum of 16 horsepower to ensure sufficient pulling power. Power rodding machines shall be of a continuous rod-type capable of holding a minimum of 1,000 lineal feet of rod. The machine shall have a positive rod drive to produce a 2,000-pound rod pull. To ensure safe operations, the machine shall have a fully enclosed body and an automatic safety throw-clutch and other safety equipment required by law. Bucket machines and rodders

shall be equipped with proper tools for all types of cleaning in the sizes of pipe in which work is to be performed.

Whenever bucket machines are used, the bucketing process shall be in one manhole section at a time. A bucket of proper size shall be placed in the downstream manhole and pulled at intervals toward the upstream manhole until the entire manhole section has been cleaned. Upon completion of the bucketing operation, hydraulically propelled or high-velocity sewer/storm drain cleaning equipment shall be used to ensure that all sand, grease and other fine materials have been removed. Satisfactory precautions shall be taken to protect the pipelines from damage that might be inflicted by the improper use of cleaning equipment.

After cleaning the mainline, the Contractor shall spray or wash down the interior walls of each manhole with a nozzle or gun using approximately 500 psi of water.

When the Contractor has been authorized to take water from fire hydrants:

- The water shall be conserved and not used unnecessarily.
- Only approved fire hydrant wrenches and shut off valves shall be used.
- A visible air gap shall be maintained between the discharge of the fire hose and the Contractor's water storage tank. The air gap shall be visible from the ground surface.
- No fire hydrant shall be obstructed except to refill empty water tanks.

All sludge, dirt, rocks, sand, grease and other solids or semisolid materials resulting from all types of cleaning operations shall be trapped and removed at the downstream manhole of the section being cleaned. Passing materials from manhole section to manhole section, which could cause line stoppage, accumulations of sand in wet wells or damage to pumping equipment, shall not be permitted. All solids or semi-solid material removed from the wastewater collection system during the cleaning operation shall be removed from the site and disposed of in a lawful manner.

Final acceptance of the cleaning work will be made after CCTV inspection completion.

FLOW CONTROL

The maximum allowable depth of flow in pipelines to be inspected using closed-circuit television (CCTV) equipment varies by the pipe size as shown in the following table.

PIPE SIZE	**PERCENT OF PIPE DIAMETER**
6" – 10" Pipe	20% of pipe diameter
12" – 24" Pipe	25% of pipe diameter
27" & up Pipe	30% of pipe diameter

When the depth of flow in the sanitary or storm drain pipeline is above the maximum allowable, or inspection of the complete periphery of the pipe is necessary to effectively conduct the television inspection operations, one or more of the following methods of flow control shall be used. Where high flows are encountered after the pipelines have been cleaned, priority consideration shall be given to scheduling the CCTV inspection work for the late night hours between 11:00 p.m. and 6:00 a.m.

When and where bypass pumping is required to meet the requirements for the maximum depth of flow, the Contractor shall submit to the City detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor to implement bypass pumping. The plan shall be specific and complete, including such items as: schedules, notifications to the users of the manhole section when the CCTV inspection is to occur with any special instructions, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities. The plan shall include compliance with the City's National Pollution Discharge Elimination System (NPDES) permit requirements and conditions. No work shall begin until all provisions and requirements have been reviewed and approved by the City.

A. Plugging and Blocking: plugs shall be inserted into sanitary or storm drain pipelines at a manhole upstream from the section to be inspected, tested and/or sealed. the plug shall be so designed that a portion of the sewer/storm drainage flows can be released. flows shall be substantially reduced or temporarily stopped to properly inspect the pipe.

B. Bypass Pumping: when bypass pumping is required to ensure completion of the television work, the contractor shall be required to furnish the pumping equipment, conduits, etc. Necessary to perform this item of work. The design, installation and operation of the temporary pumping system shall be the contractor's responsibility.

All pumps used shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods of time to accommodate flow variations. All discharge

systems shall be constructed of rigid pipe with positive, restrained joints to prevent accidental spills.

TELEVISION INSPECTION

After the pipeline has been cleaned, the manhole sections shall be visually inspected by means of closed-circuit television. The inspection shall be done one manhole section at a time and the flow in the section being inspected shall be suitably controlled as specified herein. Closed-circuit television (CCTV) inspection shall be used to assess:

- The condition of existing pipeline.
- Root intrusion problems, if any.
- Internal defects that should be corrected and applicable repair or rehabilitation methods.
- Infiltration sources.

The Contractor shall be responsible for providing quality audio, video, and written documentation of pipeline condition. This shall include recording all defects, including visual evidence of groundwater infiltration and any structural defects.

If the CCTV inspection work reveals any defects or conditions that could reasonably lead to an emergency blockage or pipe failure, the Contractor shall immediately notify the City and, as applicable, move on to other pipelines, continuing work uninterrupted. Additionally, any obstructions that significantly restricts the flow and could cause a sewer surcharging or flooding problem shall be reported to the City immediately and the Contractor's crew shall move on to other pipelines, continuing work, as applicable.

The Contractor shall coordinate on a daily basis and make provisions to ensure the City representative is present whenever CCTV inspection work is being performed. While it is understood that the City representative(s) may not always be present, the Contractor understands that the City representative(s) may be present at various points during the work to assess that quality requirements are carried on throughout the work.

Inspections shall be performed while the line segments are in service without the need for plugging or flow diversion unless previously approved by the City. If necessary, the Contractor shall schedule the work to be performed late at night between the hours of 11:00 PM and 6:00 AM. Late night CCTV inspection work shall not begin until the Contractor has received approval from the City for a nighttime traffic control plan submitted by the Contractor.

All line segments shall be televised complete from starting manhole to ending manhole on the same video in a continuous run. Partial televising on one video and then completing the run on another is unacceptable and segments so documented shall be rejected.

Cracks, chips visible infiltrations and other defects not consistent with these Standards shall be corrected in a manner acceptable to the City. The failing section of pipe shall be again CCTV inspected after the repair work has been completed.

A. Equipment and Procedure: The CCTV inspection shall be completed using a cable-pulled or self-propelled closed circuit television camera. The camera shall be operative under 100 percent moisture conditions. Cameras used for CCTV inspection of pipelines eight inches in diameter and larger shall be of the articulating head type to allow laterals, joints and defects to be viewed directly.

The television camera used for the inspection shall be a color format specifically designed and constructed for such inspections. Lighting and camera quality shall be suitable to allow a clear and focused picture clearly showing the entire inside periphery of the sanitary or storm drain pipeline for a minimum of six lineal feet ahead of the camera. The camera shall have a minimum capability of 350 line resolutions. The camera shall be equipped with a variable intensity control of the camera lights with remote control adjustments for focus to ensure peak picture quality throughout all conditions encountered during the survey. Focal distance shall be adjustable. Camera monitors shall be located where a City representative can view the monitor and make notes in addition to the operating technician. Monitors shall have a resolution capability of no less than 525 lines. The date of the survey, the number or location of the beginning and ending manholes for the pipeline being surveyed, and a continuous forward and reverse read-out of the camera distance from the manhole of reference shall be continuously displayed on the monitors as part of the video presentation.

A Polaroid-type or a digital camera with a resolution of capacity no less than 720 by 1024 lines per inch shall be available for making still photos for reproduction from the video monitor(s). The still cameras shall be equipped with proper lens and mountings to frame the monitor. Photos shall be taken at the request of the City's representative or the discretion of the operating technician to record conditions of interest during the survey.

The Contractor shall control the movement of the television camera at all times. This may be accomplished by means of remote control winches or by telephone or other suitable means of communication between the winches at either end of the manhole section being surveyed. The travel

speed of the camera shall be uniform and shall not exceed 30 feet per minute. Any means of propelling the camera through the sewer/storm drain that would exceed this rate of speed or produce non-uniform or jerky movements shall not be acceptable. In no case shall the hose of a high-velocity water cleaning machine be allowed for use as a tow cable. The camera shall be stopped and/or backed up to view and analyze apparent defects and unusual or uncommon conditions within the pipeline. The Contractor shall at all times be able to move the camera through the line in either direction without loss of quality in the video presentation on the monitor. The picture shall provide a clear, stable image of the resolutions specified.

The Contractor shall furnish the City with video of an actual sewer/storm drain line inspection that is satisfactory to the City and meets the job specifications for television inspection to establish working criteria for video picture quality which must be maintained throughout the project. This video shall become the property of the City and shall be used throughout the project as a standard that the Contractor's video picture quality must meet.

The pipe diameter shall be obtained by physical measurement in the upstream (or downstream) access structure. Pipe material, i.e., RCP, VCP, CMP, and lengths between manholes shall also be verified and documented.

B. Video: The Contractor shall provide an acceptable picture that is in focus, distinct, clear, and properly illuminated, with good contrast and without distortion. The picture shall be of true and adequate color and tint, free from interference and distortion. The picture shall show at least 70 percent of the pipe periphery above the waterline. All recording shall be in color on approved digital format in media as determined by the City using an articulating head type camera with the ability to achieve and maintain proper balance of tint and brightness. The loss of color or severe redness due to equipment malfunction and black and whites pictures irrespective of quality shall be cause for rejection.

The camera lens shall be kept clean and clear and any fogging due to oil, grease, or other material or debris. Material that obscures the lens shall be cleaned off before proceeding with the recording operation. If debris or other obstructions cause reduced visibility, or if the image is obscured, the Contractor shall make reasonable attempts to clear the lens of the camera before continuing inspection.

The camera lens shall remain above the visible water level and may submerge only while passing through clearly identifiable line sags. If at any time the flow exceeds 25 percent of the diameter of the pipeline, the inspection must be stopped until the flow subsides or, if necessary, the

Contractor shall reschedule the inspection, possibly for a late night inspection of the pipeline.

The camera shall be stopped, for a minimum of five (5) seconds at every lateral to look up the lateral and see any apparent defects, broken pipe, root intrusion, or other defects. The lens and lighting shall be readjusted, if necessary, in order to ensure a clear, distinct, and properly lighted feature. Additionally, a five (5) second blank space shall be inserted between line segments to more clearly mark the end of one (1) televised line and the beginning of another.

1. *Illumination.* The picture shall have adequate light to clearly ascertain any pipeline defects like cracks and their severity in addition to clearly seeing other features like laterals and joints.

2. *Focusing*. The picture shall be clear and distinct without being obscured by dirty lenses or foggy pipeline condition, or out of focus due to operator alertness.

3. *Color*. Loss of color for all or a part of a line may be cause for rejection.

4. *Water Depth*. High flows causing the depth of water to exceed the foregoing criteria shall be cause to reject the televised line segment. Surcharging (and flooding of the camera lens) shall not be excusable. Any condition where the camera goes under water for a reason other than a pipeline sag condition shall, in general, be an unacceptable recording condition, and the televised pipeline segment shall be subject to rejection. Surcharging (and flooding of the camera lens) shall not be an excusable condition if it has been artificially created upstream from the placement of flow plugs or flushing of the sanitary sewer.

Other unacceptable conditions that shall serve as a cause for rejection of submitted videos include, but are not necessarily limited to:

- Loss of vertical hold which impacts the ability to read and interpret the video.

- Incorrect manhole identifications if it is not clear which line has been televised.

- Inaccurate footage readings. The footage measurements shall form the basis for possible subsequent sewer repair or rehabilitation work. Therefore any inaccuracy in the continuous footage measurement to a defect or any identifiable feature which leaves doubt as to the accuracy of the location of a specific defect or the total length of the manhole-

to-manhole segment shall render the video of the line segment as unacceptable.

- Any other unidentifiable defect such as equipment interference or malfunction, blurred or obscured images from an unknown source that detracts from the ability to read the video with reliable accuracy.

C. Audio: All recordings shall have an audio descriptive narration to supplement the CCTV inspection report log. The Contractor shall clearly identify on the audio portion of the video the date of the work and the location of the beginning and ending manholes complete with the street intersections and, where applicable, house numbers. The Contractor shall also clearly identify on the audio portion of the video all important features such as the location of all laterals, taps, breaks, roots, and other defects in addition to information identifying which manhole-to-manhole segment is being inspected. These features are to also be noted on the written video log.

The audio portion of the composite signal shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio reports shall be recorded on the videos as the CCTV inspection is being completed and shall include the location of the pipeline segment being inspected, street location or manhole numbers involved, a manhole-to-manhole direction of travel, and a description of the pipeline conditions as they are encountered.

The Contractor shall narrate the video as the pipeline is being inspected. The audio portion of the video shall conform to the following:

1. *Clear Speaking*. The technician shall speak clearly and directly without interruptions. Unintelligible speech shall not be accepted and shall be grounds for rejection of the completed video.

2. *Minimal Background Noise*. The microphone shall be positioned so that noise shall not be present from passing automobiles, trucks and construction equipment. Excessive noise is unacceptable and shall be grounds for rejection of the completed video.

3. *No Coughing or Yawning*. Personal noises from the operator while describing video recording situations shall not be accepted and shall be grounds for rejection of the completed video.

4. *No Recording On Used Video Media*. All videos and logs shall be project specific. There shall be no other recordings or portions of recordings on the same video media with another project.

Violation of any of the requirements for the audio portion of the performed work shall serve as full justification for rejection of the fieldwork. No payment will be made for rejected work.

D. Documentation: Work products for CCTV inspection shall consist of videos, CCTV inspection log sheets, and any still pictures taken of specific defects as the work proceeded. Before videos and written inspection reports are turned over to the Engineer, they shall be reviewed by a trained individual who has a minimum of three years documented experience in evaluating and prioritizing problems in sanitary/storm sewer systems. The Contractor shall prepare a written report stating the Contractor's opinions of the best method of repairing each manhole section.

The City shall review prior to acceptance the CCTV inspection documentation for an entire manhole-to-manhole pipeline segment. If any portion of a line is unacceptable, the entire segment shall be deemed unacceptable and shall be re-televised and resubmitted. A line that is partially televised and is incomplete due to an excusable condition such as a partially collapsed pipeline shall be accepted for the televised length only. CCTV inspection forms shall be evaluated against the video for accuracy and completeness, prior to City acceptance.

The videotaping and the monitoring equipment shall have the capability to instantly review both video and audio quality of the video productions at all times during the television survey. The purpose of the video recording shall be to supply a permanent visual and audio record of the manhole section surveyed. The videos shall become the property of the City upon completion of the project.

Printed location records shall be kept by the Contractor clearly showing the exact location in relation to the adjacent manholes of each infiltration point, building sewer or storm drain connections, all joints which are infiltrating or exhibit other unusual condition, roots, sanitary or storm drain connections, collapsed sections of pipe, joints sealed, presence of scale or corrosion and other discernible features. This information shall be presented to the City in a typewritten report within two weeks of the completion of the fieldwork.

E. Video Inspection of City Service Laterals: Video Inspection of City service laterals are subject to all the above requirements and shall additionally meet the following requirements.

- Video shall include data view display feature capable of showing the following information.
    - Lateral address (Lot # if no address is known)

- Date and time of inspection
- Contractor name
- Inside pipe diameter and type
- On-going footage counter accurate within 3 percent
- Identify access and starting point for video inspection, e.g., cleanout to the mainline

- The travel speed of the camera shall be uniform and shall not exceed 20 feet per minute.
- It is desirable to record during dry weather. The contractor shall introduce water prior to video inspection of the lateral.
- The direction of recording shall be forward from upstream to downstream and lengths shall be measured from cleanout to mainline.
- Video Filename: Video file for each sewer segment shall be name in one or more of the following fashions. The Contractor shall submit for approval the preferred file naming scheme prior to commencement of work.

1) For sewer mains between manholes and/or flushing branches

   b. Street name or easement name with name of cross streets (ex. MainSt Broadway to Hollywood).

   c. Pipe segment designation and street name (ex. PS1564. mp4)

   d. Manhole designation in the following fashion, upstreamMH downstream MH. (ex. S1548 S1547.mp4)

1) For sewer lateral and other connection off a sewer main

   a. Street name and address number (ex. MainSt 313.mp4).

   b. Facility name, address, and location of lateral inspection (ex. Macys 123MainSt SWcorner.mp4)

   - Hard copy of video log to accompany the video inspection and all deficiencies are identified on the log sheet.
   - City project manager notes and sign off on review of material prior to turning over to the O&M supervisor. Package must be neat and orderly.

APPENDIX K

STORM DESIGN SHEET

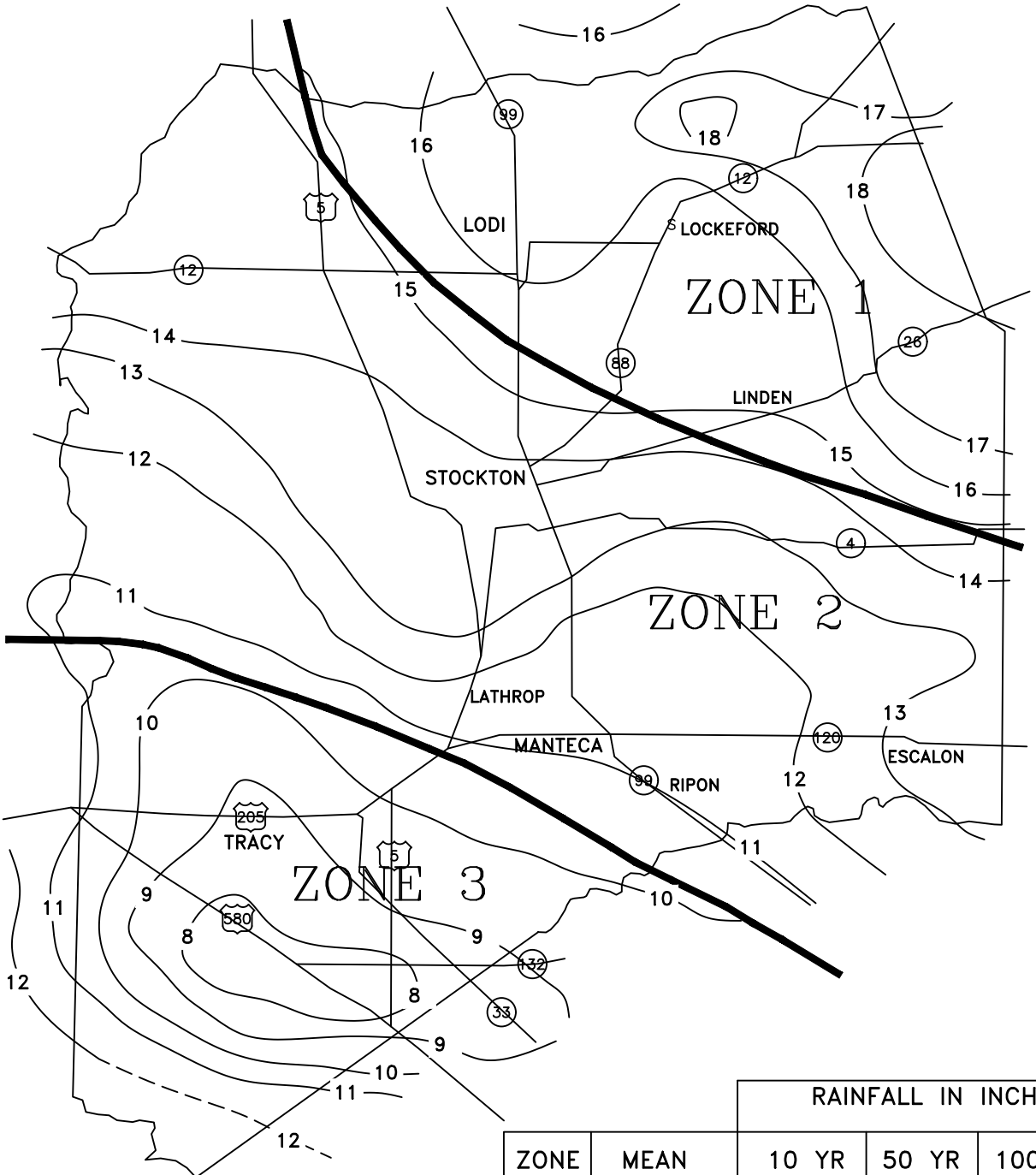
SUBJECT ____________________
____
____

DESCRIPTION ____________________
____
____

JOB NO. ____________________ SHEET ________ OF ____
DESIGN BY ____________________ DATE ________ 20 ____
CHECKED BY ____________________ DATE ________ 20 ____

BEGINNING DESIGN DATA:
ASSUME TIME TO INLET = ____________________ MINUTES ____________________
ELEVATION HGL AT BEGINNING OF SYSTEM = ________ A HGL ELEV ____________________
ELEVATION HGL AT END OF SYSTEM = ____________ APPROXIMATE SYSTEM LENGTH ________________
APPROXIMATE AVERAGE SLOPE ________________

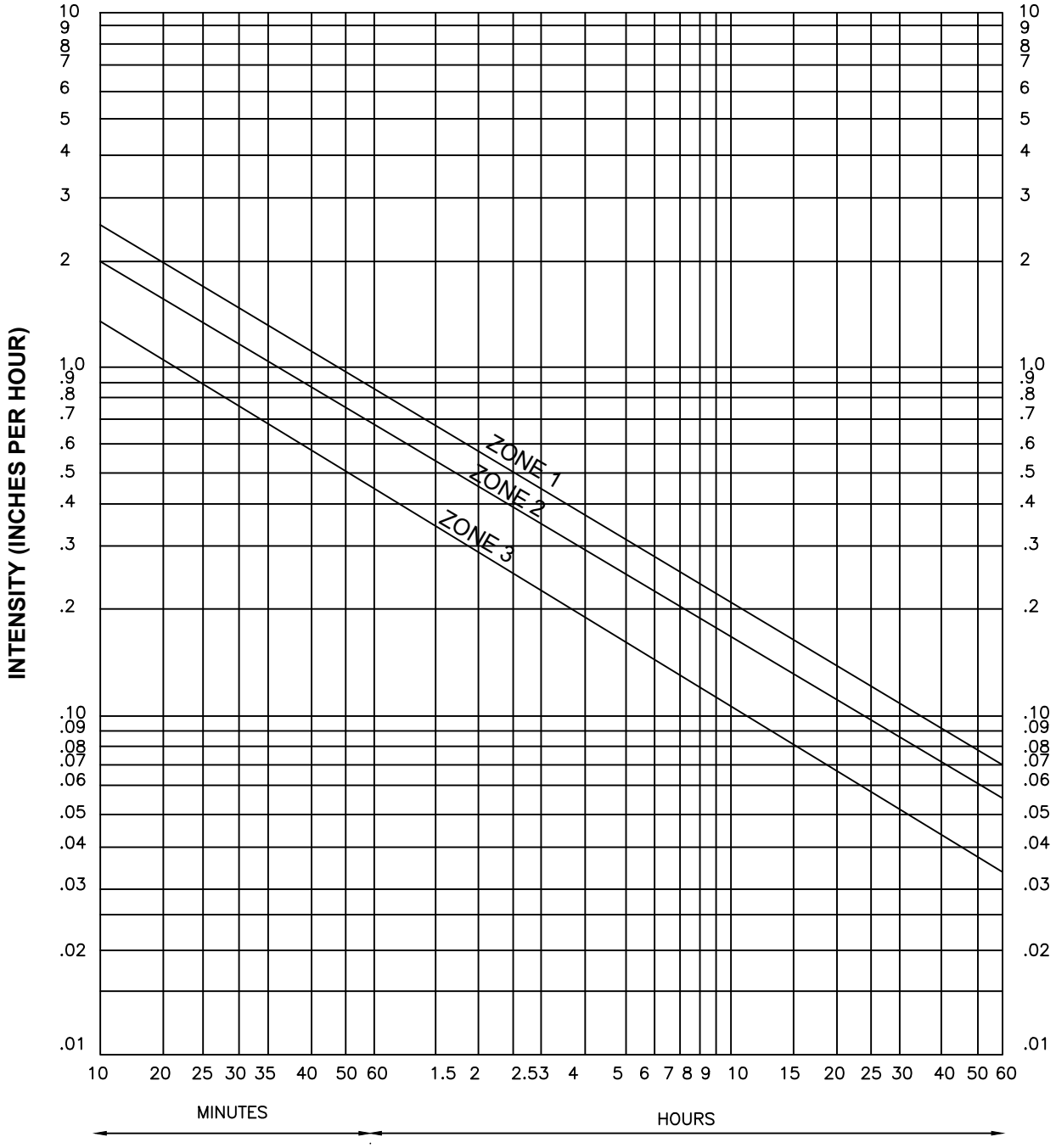
POINT OF CONCENTRATION	CONTRIB. Ac (A)	RUNOFF Coef (C)	CA	CA	INTENSITY (i)	Q cfs (CAxi)	PIPE DIAMETER	SLOPE FT/FT	LENGTH (FT)	ELEV (FT)	ELEV HGL (FT)	VELOCITY (FPS)	T. MIN IN PIPE	T. MIN TOTAL



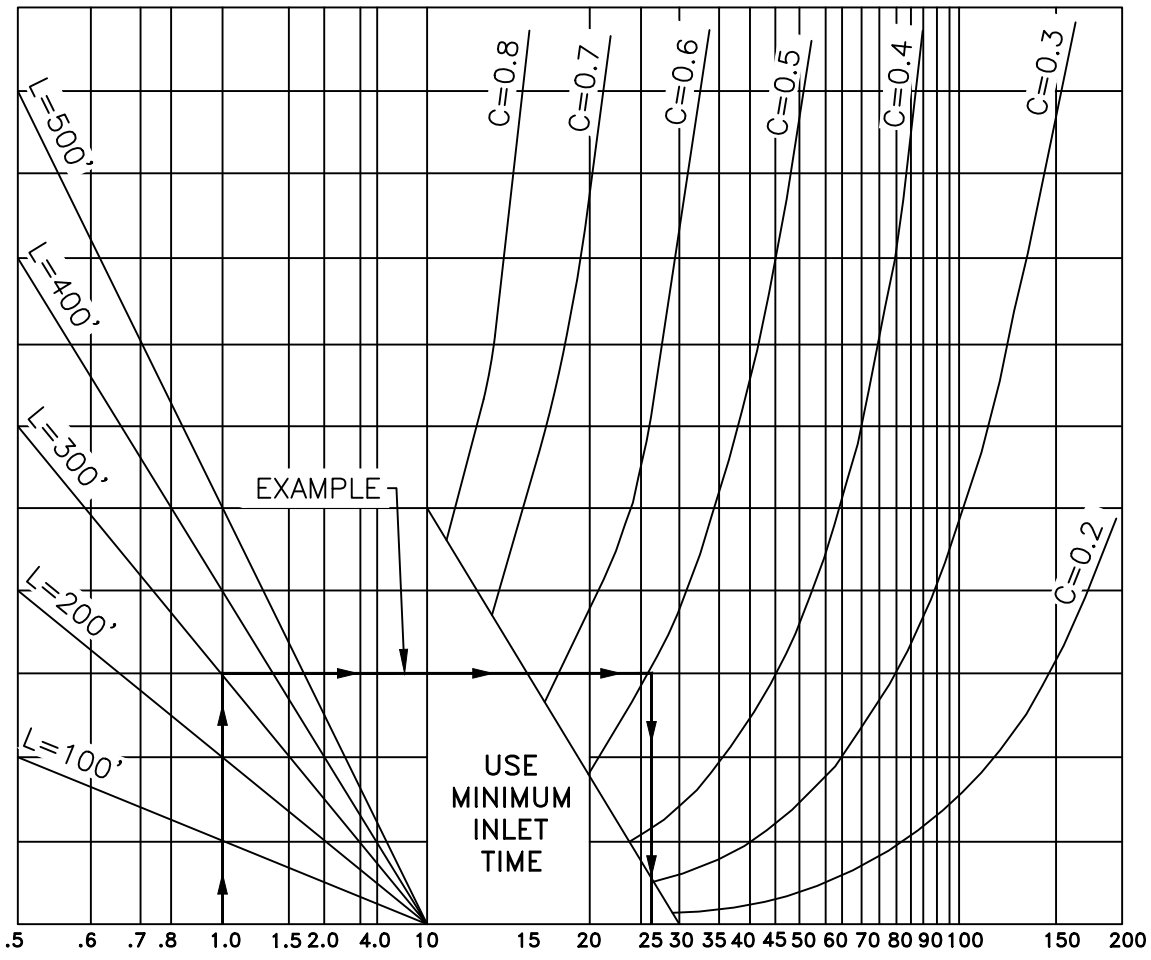
SAN JOAQUIN COUNTY
ISOHYETAL MAP

ZONE	MEAN ANNUAL RAINFALL	RAINFALL IN INCHES		
		10 YR 48-HR STORM	50 YR 48-HR STORM	100 YR 48-HR STORM
2	13.5"	3.12"	3.74"	4.37"

MEAN ANNUAL PERCIPITATION



INTESNITY-DURATION CURVE 10-YEAR RAINFALL



SLOPE %

INLET TIME (MIN.)

EXAMPLE

GIVEN: SLOPE = 1%
LENGTH = 300–FT
COEFFICIENT OF RUNOFF = 0.5
READ: INLET TIME = 26 MINUTES

NOTE

WHERE FIRST INLET IS IN A PUBLIC STREET, SUCH AS IN A SINGLE–FAMILY SUBDIVISION, USE ONLY SLOPE AND DISTANCE FROM BACK OF LOT TO THE STREET GUTTER. (DISREGARD STREET GUTTER FLOW TIME)/

INLET TIME