Estimate Drawing Standard

SVP STANDARD: SD 1800

ISSUING DIVISION: Energy Distribution **EFFECTIVE DATE: October 1, 2010**
SVP SPONSOR: Orville Plum, Div. Mgr - Engineering **REVIEW DATE: January 2015**

SECTION: Drawings

Scope:

This standard outlines the basic guidelines to be followed by Estimators preparing Estimate Drawings. The guidelines establish the expectations for the accurate delineation and uniform representation of all pertinent information including general layout, abbreviations, and symbols used in the creation of Estimate Drawings.

Purpose:

Estimate Drawings are drawings, diagrams, sketches, notes and/or plans to aid in the construction of electric facilities . The drawings are a representation of the proposed work in sufficient detail to enable construction personnel to plan and complete the work. Estimate drawings are not detailed maps.

Drawings are an important part of the estimate because they are almost always easier to understand than a written description. The drawings must clearly illustrate the overall objective of a proposed project, as well as the detailed work plans. The detailed plans and notes enable the construction personnel to construct and complete the job and mapping personnel to map and record the facilities.

References

None

Rescissions

UG 604 – date 5/21/86 "Symbols for Underground Electric Lines for Estimate Drawings"
"Abbreviations" - not dated

Definition of Terms:

- **Large Font:** Text Height in Paper Space .150 / RomanS Font
- **Regular Font:** Text Height in Paper Space .100 / RomanS Font
- **Small Font:** Text Height in Paper Space .075 / RomanS Font

LARGE FONT
REGULAR FONT
SMALL FONT

- **Heavy Line:** 2.50 width in Model Space at 1" = 100'
- **Regular Line:** 1.00 width in Model Space at 1" = 100'
- **Thin Line:** 000 width in Model Space at 1" = 100'
- **Leader Line:** Regular Line with arrow at one end used to lead the eye to a note

Abbreviations: See Exhibit "A" Abbreviations

Field Checks:

Estimators, prior to going in the field, are expected to research office records, block maps, circuit diagrams, etc., to obtain information on existing facilities, streets, roads, highways, subdivisions and property lines. After completing their field investigation, they are to determine if the office information is correct and accurate. If not correct, they are to forward the necessary information to mapping so that mapping can update the records and maps to reflect current field conditions.

General Drawing Requirements:

1) Neatness:

Keep drawings neat and clear. Use general notes or symbols to cover items that appear at several locations in the drawing. Place notations on drawings parallel with the bottom so notes can be read without turning the drawing around. Avoid clutter, crisscrossing of lines and excessive use of arrows. Use Details as needed to clarify job instructions. Be sure drawings are complete and include a sheet number, title, legend, north arrow, scale, boundaries of work, and street/road names.

2) Paper Size

Paper sizes of 8½" x 11", 11" x 17" or 24" x 36" are preferable, since most copying machines easily duplicate these. The paper should include a ½" margin line around the edge. Keep the drawing as small as clarity permits, leaving room for notes, legends, and other job data.

3) Title Block:

Complete all elements of the title block using regular font unless noted. The Standard Silicon Valley Title Block should be used. It should include Title, Designed By and Date, Draw By, Date, Map Number, Sheet Number, Drawing Number, Revision Number, Approved By and Date, and Scale.

A) Title:

The Title should include the project name with street address under the project name. It should be shown as a large bold font. Under the project name and address should be "SILICON VALLEY POWER" using regular size bold font and under it should be "CITY OF SANTA CLARA" shown as a large bold font.

B) Revision Number:

Use Revision Numbers if the drawing is modified **after** copies are made and distributed. The Revision Number should be shown in the lower right hand portion of the Title Block. It should be shown in large bold font. In addition, above and adjacent to the Title Block there should be at least 3 blank rows for 4 columns labeled Revision Number, Date, Description, and Approved By. A concise description of what has changed should be included under the Description Block. An optional triangle inscribed with the Revision Number shown in the block and on the corresponding area of change on the drawing maybe used. The Revision Number is changed on all the sheets. The reference Description block is revised only on the sheet that has the revision shown.

C) Sheet Number:

The sheet number of drawings should start with 1 and say " SHT 1 OF X" where X is the total number of drawing sheets for each of the Developer's Work and City's Work drawings.

D) Scale:

Prepare Estimate Drawings to scale whenever possible. If the drawings are not to scale, place the items in their relative positions. Use a larger scale or exaggerate street widths if necessary for clarity. A scale should be chosen as small as clarity permits, leaving room for notes, legends, and other job data. Always use an Engineers scale. Put the scale chosen in the Title Block. Use dimensions if not to scale. Avoid using "as noted" or "not to scale".

E) Drawing Number:

The drawing number is usually the Estimate Number. It should be shown in large bold font. Do not use "Estimate" as the Estimate Number.

F) Drawing Type Reference Box:

A reference to the type of Estimate Drawings required. It will include three boxes side by side with each box labeled CTY. WK. for City's Work, DEV. WK. for Developer's Work, and IMP. PLNS. for Improvement Plans. Each box will be checked as required to complete an estimate package.

4) Orientation:

Orient the drawing with the North arrow pointing to the top of the sheet or pointing to the right of page. Show the North arrow in the bottom right hand corner of the main drawing area above the Title Block. Always show the North arrow for other maps (e.g. location map, detail maps, etc.) pointing in same direction as the main drawing North arrow.

5) Construction Notes:

Number construction notes starting from the location the work begins. Continue in a logical sequence that the work will progress. Label numerically starting with the number 1 inscribed in a hexagon for each work instruction required to

complete the construction. Work notes referring to pages in Silicon Valley Power Underground Engineering Standard UG-1000 should be inscribed in a circle.

The corresponding wording for each inscribed numerical hexagonal note should be placed on the drawing where space permits. Place in numerical sequence with the inscribed numerical hexagonal at the beginning of each note. Duplicate notes may have multiple inscribed numerical hexagonal numbers grouped at the beginning of the note. If the drawing consists of more than one sheet continue numerical hexagonal notes on subsequent sheets. Show the corresponding wording for each inscribed numerical hexagonal note on each sheet. If the corresponding inscribed numerical hexagonal note is not used on the additional sheets do not include it in the numerical sequence for that page. Make notes short, concise, and to the point. Refer to Exhibit "C" - Sample Construction Notes. Include reference to City of Santa Clara Overhead or Underground Standard Drawing Numbers when possible, rather than copying details on the drawings to describe the work required.

6) Location Map:

Prepare a location map for all job estimates when a construction drawing does not include a street and a cross street name. The location map is usually attached to an estimate in the lower right hand portion of a the drawing above the title block. The purpose of the location map is to adequately locate the work site geographically for individuals unfamiliar with the area. An excerpt from the County Assessor's Parcel Map or City base map is an acceptable source for a location map. Show how to reach the location from a major street keeping the number of streets shown on the map to a minimum. Use a scale as small as practical and yet keep the map clear and readable. Orient the location map so that the North arrow corresponds to the Developer's work drawing's North arrow.

Show streets, street names, property lines, etc. in the map. Label as "Location Map" with the scale (not to scale) below the Title.

7) Symbols:

Use symbols rather than notes and arrows to keep the drawing clear and legible. Exhibit "B" - Symbols shows the typical symbols used on SVP drawings. If necessary, use additional symbols to clarify what must be done. Use a legend block to explain all symbols that appear on the drawing.

8) Dimension Lines:

Dimension lines, using regular font and line weight, are to be used to reference new facilities (transformer pads, splice boxes, street light foundations, etc.) from known features (building, face of curb, wall, property line, etc.).

9) Rights-of-Way:

Show all proposed and existing electrical easements. Label as "Required" or "Existing", "P.U.E.", "UGEE", "WCE", "Electrical Easement", etc.. For existing easements, include a reference to the County's Book and Page Number or Parcel/Tract Number granting the easement.

10) Details:

Use a Detail if an area on the drawing is congested and hard to read. If a Detail is used, show all notes, dimensions, etc. in the Detail and not on the area of the drawing. Label Details alphebticaly starting with "A" with the exception of a riser, transformer, or location detail. Title the Detail using large bold font as "Detail A" with the appropriate scale shown below using regular font. Try to keep the number of details to a miniumum (use only when needed).

Types of Estimator Drawings:

An estimator typically prepares three types of drawings:

1) Developer's Work (substructures and underground conduit system).

2) City's Work (overhead/underground circuit system).

3) Street Improvement Plans.

1) Developer's Work Drawings:

A) Purpose:

Certain work may be required to be done by the Property Owner/Developer as a condition of approval for Development of the property. Developer's Work may not be required for Estimates such as "Service Relocations", "Street Lighting", etc..

B) Work Type:

The Developer's Work drawings should be labeled above the Revision Table row. It should be labeled "Developer's Work" using large bold font. See Exhibit "E" – Developer's Work Drawing Template.

C) Scale:

Developer's Work Drawings should use an Engineer's scale, usually at 1"=20'. If clarity permits, a scale of up to 1"=40' may be used.

D) Page Numbering:

The page number shown in the Title Block should start with the number 1 using regular font and include the total number of sheets in the

Developer's Work Drawing package not including a count of the City's Work Drawings. Example; "SHT 1 of 4".

E) Validity Statement:

In the lower right hand corner of the drawing to the left of the Title Block include the following statement in regular bold font:

"IN ORDER TO CONSTRUCT WORK SHOWN ON THIS DRAWING YOU MUST HAVE A VALID BUILDING PERMIT AND START CONSTRUCTION WITHIN 6 MONTHS OF DATE OF APPROVAL OF THIS DRAWING. FOR AN EXTENSION OF TIME, PLEASE CONTACT SVP AT (408) 261-5292".

F) Legend:

Use the standard Silicon Valley Power Legend (4½" by 7¾"). Locate the Legend in the upper right hand corner of the drawing. All standard symbols used and any additional symbols used should be shown in the Legend.

G) General Note:

Use standard Silicon Valley Power General Notes (5" by 8"). Locate General Notes in the upper right hand corner of drawing under the Legend. Any additional general notes used should be shown under the General Notes. Put an "X" in the appropriate location at the beginning of all notes used. Fill in the service voltage available (requested) along with the corresponding number of wires and enter either single or three phase depending on the type of service required. Also enter the available short circuit current based on the transformer size used and the Silicon Valley

Powers “Secondary Voltage Short Circuit Current Table”.

H) Work Area:

Include entire lot, Parcel, or Tract. Show all property lines. Show all existing and proposed Silicon Valley Power facilities including electric facilities on adjacent street, power poles, and easements. Label, using regular font, all lots on the drawing with the Parcel Map or Tract Map numbers.

I) Utilities:

Show all utilities (water, sewer, storm drain, telephone, cable TV, fiber optics, etc.) including crossings within 10’- 0” of centerline of new underground conduit system. Indicate utilities as a solid regular line. Label utility lines using regular font (may use approved abbreviations). Include in Legend.

J) Building Outline:

Show all building(s) footprint on the site using a solid thin line for existing or dashed thin line for proposed. Include numeric address (not street name) using large, regular, or small size font depending on room available. Place the address inside the building outline parallel to direction of street on the building outline side nearest the street. Label the building as “Existing” or “Proposed” in the center of the building outline using large, regular, or small size font depending on room aviable.

K) Tree Outline:

Show the center point along with the drip line of all trees in which Electrical excavation is within the tree drip line. Draft as a solid thin line.

L) Electric Room:

Show the location of outdoor switchgear (meters) or the main switchgear room including all doors to the Electric Room. Label using regular font "Electric Room".

M) Conduits:

Draw as indicated in Exhibit "C" – Symbols or as shown in the standard Silicon Valley Power Legend. Use a bold regular line to represent each conduit use (primary, secondary, S/L, or U/E) in conduit bank. Space lines approximately 1/16" apart labeling each using bold small font along each conduit line. Identify the number, use, size and if existing "E". (example----E4P5----). Dimension from centerline of the conduit bank to a known feature (building, face of curb, wall, property line, etc.). Show and label all bends with a Construction Note. If there are conduits shown on the drawing to be installed by another estimate, but it is not known if the conduits will be installed before your estimate is released to SVP field crews, show the line representing these conduits as solid but without the "E" representing existing. Use a leader line with a construction note using regular font to say "See estimate (estimate number) for this work".

N) Details:

a) Riser Detail:

A Riser Detail is required when a new conduit goes from ground level up a pole. It is delineated using a regular line as a 1" diameter circle with two intersecting lines at right angles to each other and coincident with the circle's center. The lines should extend 1/8" beyond the circle with one of the lines parallel to the direction of the circuit line. The detail should include its own

North arrow aligned to the main drawing North arrow. All risers on the pole will be shown and labeled using regular font in the appropriate quadrant including communication, cable TV and fiber risers. New risers will be normally placed in the quadrant opposite the transformer bank and away from traffic (property side of pole) or on the deadend insulator side of pole away from traffic (property side of pole). Title the Riser Detail using bold regular font as "Riser Detail" with not to scale (N.T.S.) below the title using regular font.

b) Transformer Detail:

A Transformer Detail is required when the drawing area becomes congested or is not clear. A circle or ellipse using a thin line is put around the drafting area and labeled using regular font 'See Transformer Detail "A"'. Do not include in the main drawing area any construction notes, references to pages in City of Santa Clara Electric Department Underground Engineering Standard UG-1000, transformer locating arrow or dimensions, except distances to buildings or points of reference.

On the same sheet, the Transformer Detail is shown and labeled using bold regular font as 'Transformer Detail "A"' with not to scale (N.T.S.) using regular font. In the Transformer Detail show construction notes, references to pages in City of Santa Clara Electric Department Underground Engineering Standard UG-1000, transformer locating arrow and dimensions and distances to known objects. Include Barrier Pipes if required.

2) City's Work Drawings:

A) Purpose:

Work SVP crews are required to complete is called City's Work. This work may be required due to collection of fee's such as property Development Fee's, Load Increase Fees, Service Relocation Fee's, etc.. Or City Work might be work required to improve reliability, increase capacity, or enhance street lighting. A City's Work drawing may consist of one or all of the following elements: Underground conduit/substructure system, overhead circuitry, and/or underground circuitry.

B) Work Type:

The City's Work Drawing should be labeled above the Revision Table starting at the extension of left row. It should be labeled "City's Work" using as a large bold font. See Exhibit "F" – City's Work Drawing Template.

C) Scale:

City's Work Drawings should use an Engineer's scale, usually at 1"=50'. If clarity permits, a scale of 1"=100' may be used.

D) Page Numbering:

The page number shown in the Title Block should start with the number 1 using regular font and include the total number of sheets in the City's Work Drawing package not including a count of the Developer's Work Drawings. Example "SHT 1 of 4".

E) Details

a) Riser Detail:

Show Riser Detail on City's Work the same as shown and explain in Developer's Work.

b) Low Voltage Circuit Detail:

A Secondary or Street Light Circuit Detail is a blowup of the "City's Work" drawings new underground low voltage circuits. It generally supplements the main drawing because it is not always possible to clearly show new Secondary and Street Light underground circuits. It is not necessary to draw Circuit Details to scale as long as the relative position of all equipment is shown. On the main drawing show all new underground low voltage circuits without showing conductor number, conductor size, conductor material, conductor length, Construction Notes, or notes referring to pages in City of Santa Clara Electric Department Underground Engineering Standard UG-1000. All this information should be included in the Low Voltage Circuit Detail. The Low Voltage Circuit Detail should include the **entire** secondary circuit including the padmount transformer or overhead transformer/riser pole. The conductor number, conductor size, and conductor material should be shown using regular font about ⅛ of inch above the lines representing the circuit. The conductor length should be shown using regular font about ⅛ of inch below the lines representing the circuit. Construction Notes, or notes referring to pages in City of Santa Clara Electric Department Underground Engineering Standard UG-1000 should be shown using leader lines in the Circuit Detail. Underground service conductor sizes are also shown in this detail if they impact the work area. The new

transformer load information should be included in this detail. Label Detail using underlined bold regular font.

F) Special Permits:

Show any special permit number that maybe required on drawing, example Encroachment Permit, Railroad Encroachment Permit, Caltrans Permit, etc..

G) Loads:

Do not show substation and circuit estimated load tabulations. Verify with planning engineer that load calculations and/ or load growth curves have been completed for estimates increasing or adding to existing substations.

H) Underground Conduit System:

When SVP crews install underground conduits, manholes, vaults, pull boxes, transformer pads, street light foundations, etc. the drawing should be labeled "City's Work" but shown on the drawing as discussed in this document under Developer's Work.. This work must be completed before work can start on the overhead and/or underground circuitry. Therefore, all underground conduit work should be grouped together on the first sheets or shown to the left side of the drawing.

1) 12KV and 60KV Circuits:

See Exhibit "B" Symbols for how to delineate and show primary distribution and transmission circuitry. When installing new poles, include height and class next to each pole. In addition, if new work involves a 60KV pole line include the height and class for each existing pole. Show all anchors, down guys, sidewalk guys, and head guys in the work area. For existing guys

include wire size, tension, and lead next to guying. For new guying include wire size, tension, and lead in the construction notes. If a bend occurs in the pole line show the pole line angle in degrees next to the bend location.

Dimension new poles to a known object that can be readily seen in the field or identified (building, street light, property line, etc.). If staking notes are needed, show them in sufficient detail to establish pole locations. Show all property lines adjacent to the work area. Label on the drawings all Assessors Parcel Numbers or addresses associated with the job.

When reconductoring or stringing new conductors, show the existing conductor to be removed (solid line) along with the new wire to be installed (dashed line). For each new span, show lengths between poles above the span using regular font. Use construction notes to denote total span lengths for the work area affected. In the corresponding wording for the inscribed numerical hexagonal note include the number of spans along with total length of all spans and stringing tension (example "String 3/397 AL 9 spans, 1,000'± Tension=Short Span Urban".

J) 12KV Before and After:

Prepare "12KV Before and After" sketches for all estimates when the primary circuitry will change (e.g., reconductoring, line extensions, installation of protective devices, etc.). 12KV Before and After sketches are not necessary for jobs that do not affect the primary circuitry (e.g., pole replacements and secondary rearrangement).

The 12KV Before and After sketches are usually attached to an estimate in the upper right hand portion of a drawing. It illustrates how the proposed construction will conform electrically (and sometimes geographically) to

the surrounding circuit. The 12KV Before and After sketches show the 12KV circuits (not secondary) only. Use a scale as small as practical and keep the sketch clear and readable. The 12KV before and after should include all primary circuits to the first point that can open or close a circuit such as a 12KV switch.

An excerpt from a 12KV Circuit Map is an acceptable source for the 12KV Before and After sketches. Label each sketch as "12 KV Before" and "12 KV After" with scale or not to scale (N.T.S.) below title. Orient sketches so that North arrow corresponds to City's Work drawings north arrow. Use the sketch to illustrate how the construction will conform to future plans for the area. Include conductor number and size, switch or cutout location and position. Label circuit numbers. On "12KV After" sketch show existing facilities as half tone (30% screening) and new facilities to be installed dashed with no screening.

K) Transformers:

Show transformer size, voltage rating, estimated kVA load for new transformer installations. Show phase connections for transformers when needed for load balancing. Show the entire secondary systems. On overhead installations show the secondary to the first open secondary jumper or to the end of the secondary system on each side of the transformer. Show all services coming off the secondary system. Only show the size of services for the area affected by the work.

L) Guying:

On all estimates effecting the existing guying of secondary, primary, or 60KV circuits show all existing guying including down guys, head guys and/or sidewalk guys. Use a leader line to show existing wire number,

size, tension, and lead length, label using regular font. When a Construction Note involves new guying, include wire number, size, tension, and lead length in the Construction Note and do not use a leader line.

M) Circuits:

All existing primary or secondary circuits are to be labeled using regular font about ⅛ of inch above the lines representing the circuits. Information shown is to include the number of conductors, conductor size, conductor material, and operating voltage (12KV or SEC). Repeat above for each circuit starting with the circuit at the bottom of the pole to the circuit at the top of pole. If there are two primary overhead circuits between poles being represented by two parallel lines the line nearest the symbol for pole is the bottom 12KV circuit on the pole.

In addition, label new overhead conductors, including the span lengths, about ⅛ of inch below the lines representing the circuits. Always show the appropriate symbol for conductors, transformers, switches, etc. being installed, replaced, or removed. Use an arrow to indicate when circuits continue beyond the limits of the sketch.

N) Tree Outline:

Show the center point of the tree along with the drip line of all trees in which the Overhead lines are within the tree's drip line. Draft as a solid thin line.

O) Cable Pulling:

When pulling underground primary conductors or secondary conductors that can only be pulled in one direction, it is important for Silicon Valley Power crews to know the direction to pull cables, cable tension, and

approximate cable length. This is shown on the drawing by drafting an arrow (→) using a thin line parallel to the pull placed about 1 inch ether above or below the direction of conductor pull. If the arrow has two heads (↔) it designates that the cable can be pulled in either direction.

About ⅛ of inch above this arrow show using regular font "T = (tension of pull-maximum tension if cable can be pulled in either direction) #". About ⅛ of inch below this arrow show using regular font "L = (cable length +10' for manholes and pull boxes , 6' for transformers and vaults, or 35' for primary riser) ' ±". If you are pulling more than one set of the same size conductor, show, using a regular font on the same line as the arrow, "(number of conductor sets) Sets". About ¾ of an inch above or below arrow say using regular font "(conductor size)(conductor material)(number of wires per set) 15KV". Example: "1/0 AL TRI 15KV"

P) Shutdown Coordination:

When an estimate involves an outage to one or more customers include the following note using bold regular size font "Field Foreman for shutdown contact the following:" Make a table under the note using regular size font which lists each Business Name, Business location, Name of person to contact for outage, and Phone number of person to contact.

Q) Services:

For new services, using regular font, show conductor number, size and type for each individual customer. Show building outline including building address along with meter location. For existing overhead service drops only include length of service drop. Do not show connected load at each secondary distribution point. When adding load to an existing secondary system or rearranging it, calculate the secondary load

distribution, either by connected load at each service location or the estimated demand at each pole or splice box and retain the information in the estimate folder. Do not show voltage drop calculations on drawing, but calculate the voltage drop at the service point for all new services and retain the calculations in the estimate folder.

R) Meter Stamp:

For each meter to be installed a standard SVP Metering Data block is required. Place the Metering Data block near the drawings sheet Title Block either above or to the left of it. Using regular size font list the service voltage, main size in Amperes, and the Multiplier used. Check which boxes apply for KWH-CL and KWH/KW-CL circling meter class, KVARH, TOU Recorder, CT'S, VT'S, 1Ph 2W, 1Ph 3W, 3Ph 3W, 3Ph 4W Y, and 3 Ph 4W Δ.

Group the meters by Main Size in Amperes. Above each Metering Data block using regular size font say "(total number of meters) EA= (number of meters excluding house meters) + (number of house meters) House Meters". If meters are on a Main Board, to the right of this state "Main Board Discount = (main boards amperes) Amperes". If there are meters at deferent locations above this statement make a table listing "(number of meters) Meters – (address or building number)".

S) Accounts:

The different Expenditure Accounts to be used by the field crews to complete the work required by the Estimate should be listed above the bottom boarder of the drawing where space permits. Using bold regular size font say: "<u>Accounts Used</u>" then under this using regular size font

make a table listing all the account numbers of the different Expenditure Accounts used.

T) Building Outlines:

Show all building(s) footprint on the site using a solid thin line for existing or dashed thin line for proposed. Include numeric address (not street name) using large, regular, or small size font depending on room aviable. Place the address inside the building outline parallel to the direction of the street on the building outline side nearest the street. Label in the center of the building outline, using large, regular, or small size font depending on room aviable, if building is "Existing" or "Proposed".

3) Street Improvement Plans:

A) Purpose:

Certain work maybe required to be done on the City's Streets or Right of Ways by the Property owner as a condition of development approval for the property, per City of Santa Clara requirements. This work is not required for all Estimates. The City of Santa Clara Engineering Department will determine if such work is required.

B) Drafting Requirements:

Refer to City of Santa Clara Engineering Department Design Criteria, latest revision, and "Developer's Work Drawings" of this Standard for drafting requirements.

Exhibit "A" - Abbreviations

AA or AL	All Aluminum Conductor
AAC	Aluminum Aerial Cable
abn.	Abandoned
abut.	Abutment
ABS	Acrylonitrile Butadiene Styrene (Plastic Conduit)
AC	Asphaltic Concrete
A / C	Air Conditioner
ACP	Asbestos Cement Pipe
ACSR	Aluminum Conductor Steel Reinforced
adj.	Adjusted
ahd.	Ahead
aly.	Alley
approx.	Approximate
Ave.	Avenue
B/	Back Of
B / C	Back Of Curb
B/FC	Back Of Face Curb
B / SW	Back Of Sidewalk
beg.	Begin
btwn., ~~betw~~.	Between
Blvd.	Boulevard
Bldg.	Building
BM	Bridge Main
bndry.	Boundary
BT	Bridge Tap
BTS	Bridge Tap – Single Phase
C	Contact (By SBC, or Cable TV)

CATV	Cable Television
cb.	Curb
CC	Concrete Capped Or Construction Cable (Similar To An Idle)
CE	Concrete Encased
C&G	Curb And Gutter
chnl.	Channel
CIP	Cast Iron Pipe
cdtn.	Condition
℄, ~~CL~~	Center Line
CL	Class Of Pole
CL – 4 F, 5F, 6F	Chain Link Fence (With Height)
CO	Clean Out
C/O	Cutout
cond. (tel.)	Conduit (Specify Type)
const.	Construction
cor.	Corner
corr.	Corrected
Cr.	Creek
CSP	Corrugated Steel Pipe
CTB	Cement Treated Base
Cty	County
Ct.	Court
CT	Current Transformer
CU	Copper Conductor
culv.	Culvert
CW	Copperweld
DAA	Double Alley Arm
DAP	Double Arm Primary
DAPDE	Double Arm Primary Dead-End

DAS	Double Arm Secondary
DB	Direct Buried Cable
Dp.	Deep
deg.	Degree
descr., ~~desc.~~	Description
dest.	Destroyed
DF	Dead Front
dia.	Diameter
dist.	Distance
dbl.	Double
DDE	Double Deadend Arm
Dir Bored	Directional Bore – Depth Will Vary
dn.	Down
Dr.	Drive
DUP	Duplex (Bundled Conductor)
D / W, ~~drwy.~~	Driveway
E	East
E	Existing
ECR	El Camino Real
elier.	Electrolier
el.	Elevation
ELF	Energy Limiting Fuse (Type Of Fuse Used In Cutouts)
ELY.	Easterly
E /	East Of
EC	Electric Circuit
E/G	Edge Of Gutter
E/P	Edge Of Pavement
ER	End Of Radius
exist.	Existing

Expy.	Expressway
F	Foreign
F / C	Face Of Curb
FA	Fire Alarm Circuit Or Equipment
FAPB	Fire Alarm Pull Box
FAC	Fire Alarm Interconnect Cable Conduit Or Box
fdn.	Foundation
fe.	Fence
FH	Fire Hydrant
FLA	Full Load Amps
FO	Fiber Optic Conduit
FS	Fire Service
ft.	Feet
FP	Fence Post
Fwy.	Freeway
galv.	Galvanized
grnd.	Ground
GS	Guy Stub
gtr.	Gutter
GAP	Great America Parkway
H	Fiber Optic Contact By Sprint
ht.	height
HPS	High Pressure Sodium Vapor Street Light
HV	High Voltage (12, 60, & 115 Kv)
Hwy.	Highway
in.	Inch
ID	Inside Diameter
int.	Intersection
inv.	Invert (Flow Line Of A Conduit)

IP	Iron Pipe
irr	Irrigation Service
irr. P	Irrigation Pipe
J	Joint Ownership
JT	Joint Trench
jct.	Junction
K	Pole Contact By ?
KI	Key Interlock
KV	1000 Volts (Kilovolts)
kVA, ~~KVA~~	1000 Volts Amps (Kilovolt Amps)
kWH, ~~KWH~~	1000 Volts (Kilowatt Hours)
LB	Load Break
Ldscp	Landscape Service
LF	Live Front
Ln.	Lane
lt.	Left
L/G	Lip Of Gutter
LPS	Low Pressure Sodium
LV	Low Voltage
LVPB	Low Voltage Pull Box
max.	Maximum
MCB	Mission College Blvd
meas.	Measured
MH	Manhole
mi.	Mile
MV	Mercury Vapor
MI	Mechanical Interlock
min.	Minimum
Mon.	Monument

N	North
N	Neutral
N /	North Of
NC	Normally Closed
NW	Northwest
NE	Northeast
N / S	North Side
Nly.	Northerly
NO	Normally Open
no.	Number
OCB	Oil Circuit Breaker
OCF	Owens – Corning Fiberglas
OD	Outside Diameter
OH	Overhead
O / S	Offset
O / SW, ~~**O / S**~~	Oil Switch
P	Primary
p.	Page
PacBell	Pacific Bell Telephone
pavt.	Pavement
PB	Pullbox (High Voltage)
PCC	Point Of Compound Curve
PG&E	Pacific Gas & Electric
PI	Point Of Intersection
℄, ~~P/L~~, ~~PL~~	Property Line
pl.	Place
PLN	Paper And Lead Cable Wirh Neoprene Jacket
PM	Padmounted
PMP	Perforated Metal Pipe

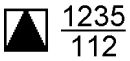
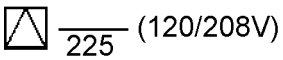
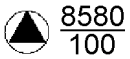
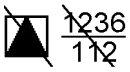
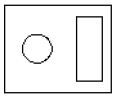
p.p.	Power Pole
pp.	Pages
PRC	Point Of Reverse Curve
press.	Pressure
PT	Point Of Tangency
pt.	Point
pvt.	Private
prod.	Produced
PVC	Polyvinyl Chloride (Plastic Conduit)
QUAD, ~~QD~~	Quadraplex (Bundled Conductor)
R	Riser
R	Radius
R/W	Right Of Way
RCB or RCP	Reinforced Concrete Box
Rd.	Road
rdwy.	Roadway
ref.	Reference
rk.	Rock
ret. w	Retaining Wall
Riv.	River
RS	Rigid Steel
Rte.	Route
RP	Reference Point
RR	Railroad
rt.	Right
S	South
S or SEC	Secondary
S/	South Of
SAA	Single Alley Arm

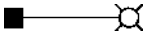
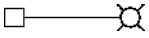
SACO	Single Arm Cutout Arm
SAS	Single Arm Secondary
SASDE	Single Arm Secondary Dead-End
SAP	Single Arm Primary
SAPDE	Single Arm Primary Dead-End
SD	Storm Drain
SE	Southeast
S/S	South Side
SB	Solid Blade (Disconnect)
sec.	Seconds
shldr.	Shoulder
Sht.	Sheet
SL	Street Light Circuit Or Equipment
SLD	Sea Level Datum
SLP	Street Light Pilot (Arrow Indicates Direction Of Current flow)
SLPB	Street Light Pullbox
sly.	Southerly
S.P.R.R.	Southern Pacific Railroad
SPTC	Southern Pacific Transportation
SS	Sanitary Sewer Line
St.	Street
Sta.	Station
Std.	Standard
Stk.	Stake
Stl.	Steel
Stpd.	Stamped
Str.	Structure
SU	Supervisory Line
subd.	Subdivision

SVP	Silicon Valley Power
SW	Southwest
SW	Switch
S / W	Sidewalk
T	Traffic
T	Timed
T / C	Top Of Curb
TB	Top Of Bank
TP	Turning Point
TPP	Temporary Power Pole
Tr.	Tract
TRA	Transite / Soapstone (Used In Pipes)
TRI	Triplex (Bundled Conductor)
U /	Under
UE	Utility Electric Conduit
UG	Underground
U.P.R.R.	Union Pacific Rail Road
USC&GS	United States Coast & Geodetic Survey
USCE	United States Corps Of Engineers
USGS	United States Geological Survey
V	Vault
V/SW, ~~VS~~, ~~V / S~~	Vacuum Switch
VCP	Vitrified Clay Pipe
vert.	Vertical
VT	Voltage Transformer
W	West
W, ~~WL~~	Water Line
W / S	West Side
W /	West Of

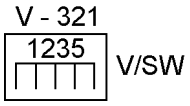
w /	With
Wly.	Westerly
WP	Weather Proof
WSP	Welded Steel Pipe
X	Contacted By TCI
XFMR	Transformer
XLPE – AA	Cross Linked Polyethelyne W / Aluminum Conductor
XLPE – CU	Cross Linked Polyethelyne W / Copper Conductor
xing.	Crossing
X sec.	Cross Sections
	Angle Point
Ø	Phase
&	And
@	At
/	Of
/	Sand Encased
.	Electrolier In Field Permanently Left Off

Exhibit "B" - Symbols

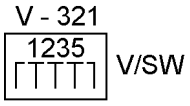
	Transformer pad, existing.
	Transformer pad to be installed.
	Transformer pad and transformer existing (City number and KVA rating shown).
	Transformer pad existing with transformer to be installed. Indicates KVA rating and voltage.
	Submersible Transformer. (City number and KVA rating shown).
	Transformer to be removed or replaced.
	Vault, primary existing, for above grade switch.
	Vault, primary to be installed, for above grade switch.
	Remote switch pad, existing.
	Remote switch pad to be installed.
	Manhole or Pull Box, primary, existing.
	Manhole or Pull Box, primary, to be installed.
	Switchgear to be installed

	Switchgear, existing
	Splice Box, secondary, existing, 42” x 66” or N-52.
	Splice Box, secondary, to be installed 42” x 66”.
	Splice Box, secondary, existing, 42” x 42” or N-36.
	Splice Box, secondary, to be installed, 42” x 42”.
	Splice Box, St. Lt. electrical, existing 17” x 30” or N-9.
	Splice Box, St. Lt. electrical, to be installed 17” x 30”.
	Splice Box, Utility Electrical, existing 17” x 30” or N-9.
	Splice Box, Utility Electrical, to be installed 17” x 30”.
	Street Light foundation, existing.
	Street Light foundation, to be installed.
	Street Light, electrolier and foundation, existing.
	Street Light foundation existing. Electrolier and light to be installed.
	Street Light foundation, electrolier and light to be installed.
	Primary Ducts, 2 - 4” PVC, existing.

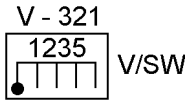
— — — — 2P5 — — — —	Primary Ducts, 2 - 5” PVC to be installed.
——————ES5——————	Secondary Duct, 1 - 5” PVC, existing.
— — — — 2S5 — — — —	Secondary Ducts, 2 - 5” PVC to be installed.
——————ES/L2——————	Street Light Duct 1 - 2” PVC existing.
——————EU/E2——————	Electric Utility Duct, 2” PVC existing.
— — — — U/E2 — — — —	Electric Utility Duct, 2” PVC to be installed.
——————————▶	Existing Private underground service entrance conductors and conduits, arrow points to service point.
—— —— ——▶	Private underground service entrance conductors and conduits to be installed, point arrow to service point.
BM - 1235 T = 500 # L = 200' ± 750 AL TRI 15KV	Install 750 AL Triplex XLPE PVC 15 kV cable and label Bridge Main #1235. Pull cable in direction of arrows. T = Tension L = Length.
BM-1 750 AL TRI 15KV	Existing 750 AL Triplex XLPE PVC 15 kV Cable.
500 AL Quad 600' ±	Install 500AL Quad 600v Cable, 600’ leg.
500 AL Quad	Existing 500AL Quad 600v Cable.
——————∿——————	Remove Symbol. Primary or Secondary.



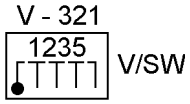
Switch existing 5 way on vault.



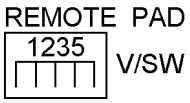
Switch, 5 way, to be installed on existing vault.



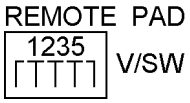
Switch existing 5 way with interrupter on vault.



Switch 5 way with interrupter to be installed on vault.



Switch existing 5 way on remote switch pad.



Switch 5 way on remote switch pad to be installed.

Padmount loop-in, loop-out Transformer.

Padmount radial feed Transformer.

Existing Utility Pole, solely owned.

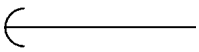
Existing Guy Stub.

Existing Pole with other utility contact.
Note: C = indicates contact by telephone company
J = indicates joint ownership.
R = indicates riser on pole.
F = indicates foreign pole.
• = indicates 60 KV on pole.

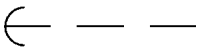
Pole to be removed.

Pole to be replaced in place.

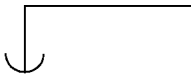
Proposed Pole to be installed.



Existing Anchor, solely owned.



Proposed Anchor to be installed.

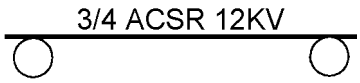


Sidewalk Guy and Anchor, existing.

Head Guy, existing.

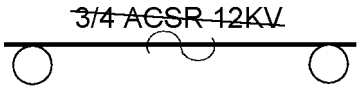
Head Guy to be removed.

Head Guy to be installed.

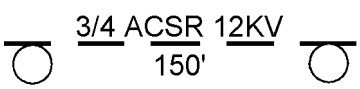


Primary, existing.
(Number of, size of, and type of wires – example CU, AA, ACSR).

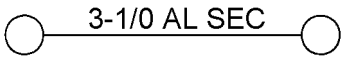
(Top Conductor – Farthest away from pole symbol)
Primary, existing, 2 circuits.



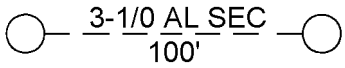
Primary, existing, to be removed



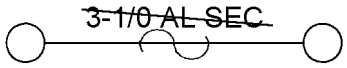
Primary to be installed. Size and length noted.



Secondary, existing.
(Number of, size of, and type of wires – example WPCU, AA).



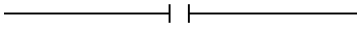
Secondary to be installed. Size, type, and length noted.



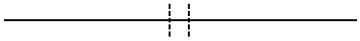
Secondary, existing, to be removed.

Street Light, existing.
(Number of, size of, and type of wires).

Jumpers, existing, closed, primary or secondary.



Breakers, existing, open, primary or secondary

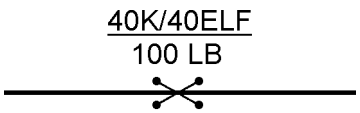


Breakers, to be installed in open position.

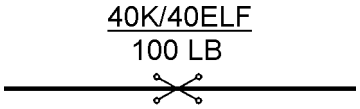
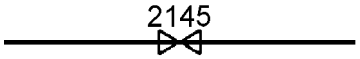
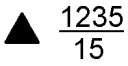
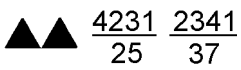
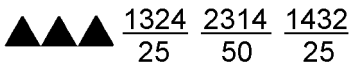
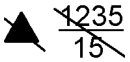
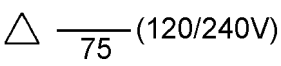
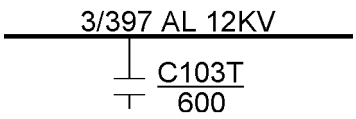
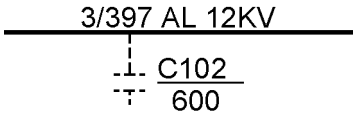
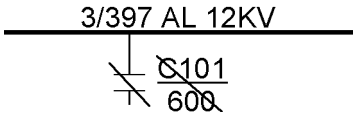
Jumpers, to be installed.

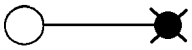
Service Drop, existing, with size noted.

Service Drop, to be installed, size and length noted.

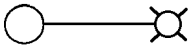


Cutouts existing. Frame and fuse size noted. “LB” indicates load break cutouts.

	Cutouts to be installed. Frame and fuse size noted. “LB” indicates load break cutouts.
	Switch, existing air type with City number.
	Switch to be removed.
	Switch to be installed with City number.
	Overhead Transformer, existing 1Ø. City number and KVA noted.
	Overhead Transformer Bank, existing open delta 3Ø. City numbers and KVA noted.
	Overhead Transformer Bank, existing, 3Ø. City numbers and KVA noted.
	Overhead Transformer(s) to be removed.
	Overhead Transformer(s) to be installed, note voltage.
	Capacitor Bank, existing, with City number shown over KVAR rating, T after C103 indicates timed bank.
	Capacitor Bank to be installed. City number and KVAR rating.
	Capacitor Bank existing to be removed.



Street Light existing on wood pole.



Street Light to be installed on wood pole.

Rental Flood Light, existing, 150W H.P.S.

Flood Light, to be installed, 150W H.P.S.

Exhibit "C" - Sample Construction Notes:

1

INTER-SET - **1-50' CL 3 POLE 1½' BEHIND F/C**
INSTALL - **1- 8' SAPL**
- **1-9' SACO W/3-100 AMP C.O.'S**
- **1-3 POT TRANSFORMER MOUNTING BKT**
- **FUSE AS REQUIRED**
- **3-12 AMP TYPE "K" FUSES**
- **1-DOUBLE 4 SPOOL EXTENDED RACK S/S POLE**
- **1-EXTENDED 4 SPOOL RACK E/S POLE**
- **2-4/0 AL 600V XLPE CONDUCTOR PER Ø & N**
- **1-SINGLE 10" PISA ANCHOR 12'L**
- **1-3/8" SEC. D.G. T=5540#**

COMPLETE RISER USING 5" PVC MOULDING

2

STRING - **2/4 ACSR ONE SPAN 140'± TENSION=SHORT SPAN URBAN**
CONNECT - **CUSTOMER'S SERVICE USING 1-4 POS 500 CONNECTER PER Ø & N**

3

INSTALL - **1-30' AL ELECTROLIER WITH 150W HPS LUMINAIRE**

4

PULL - **2/4 AL 600V XLPE FROM SLPB TO NEW S/L 120' ±**

5

REMOVE - **8' DAPDE**

6

INSTALL - **1-500 KVA TRANSFORMER, 12KV-120/208V, 3Ø, PADMOUNT, DE**
CONNECT - **PRIMARY CONDUCTORS TO TRANSFORMER USING 1/0 AL 200AMP ELBOWS**
- **CUSTOMERS SVC USING 1-6POS750 DUAL SPADE CONNECTOR PER Ø & N**

7

REMOVE - **TRANSFORMERS**
- **8' DASDE**
- **8'S/L MAST ARM & LUMINAIRE**

INSTALL - **1-9' SACO W/3-100 AMP C.O.'S**
- **1-TRIMOUNT POTHEAD BRACKET**
- **3-20 AMP TYPE "K" FUSES**
- **3-12 AMP ELF FUSES**

COMPLETE RISER USING 5" PVC MOULDING

8

REMOVE - **4/397MCM AL SERVICE DROP & 8'DASDE**
- **TRANSFORMER, CSC ELECTRIC FACILITIES, & ALL RELATED**

HARDWARE
- **TOP POLE & ABDN TO PACIFIC BELL**

9 **INSTALL** - **METERING EQUIPMENT IN CUSTOMER'S NEW SWITCHGEAR PER METERING STAMP**

10 * **DEVELOPER TO CAP 2-5" PRIMARY CONDUITS 10'-0" EAST OF MH-1222. SVP CREWS TO ROUTE INTO MANHOLE**

*** DEVELOPER TO PROVIDE SVP CREWS WITH ALL MATERIAL, LABOR, EXCAVATION, AND SIDEWALK REPLACEMENT AS NEEDED TO TIE INTO SVP SYSTEM. COORDINATE WITH LINE MAINTENANCE AND CONSTRUCTION DIVISION (408) 615-5600.**

11 **SVP CREWS TO ROUTE 2-5" PRIMARY COUNDUITS OUT OF V-293 AND CAP 5'-0" SOUTH OF VAULT. COORDINATE WITH LINE MAINTENANCE AND CONSTRUCTION DIVISION (408) 615-5600 TO INSURE NEEDED DEPTH.**

12 **5' TRANSFORMER CONCRETE APRON NOT REQUIRED IF AREA IS PAVED**

13 **CAP** - **4-5" PRIMARY, 1-5" SECONDARY, AND 1-2" ELECTRIC UTILITY CONDUITS AT PL.**

14 **REMOVE** - **DEVELOPER TO REMOVE STREET LIGHT FOUNDATION OR JACK HAMMER TO A DEPTH OF 18" BELOW GRADE OF PAVEMENT**

15 **INSTALL** - **4-5" x 45° x 5' R PVC BEND**

16 **AFTER GAS TANK IS REMOVED DEVELOPER TO GIVE SVP FIELD FOREMAN A CERTIFICATE FROM CITY APPROVED TESTING LAB THAT STATES 95% COMPACTION HAS BEEN ATTAINTED PRIOR TO TRANSFORMER PAD CONSTRUCTION, COORDINATE WITH LINE MAINTENANCE AND CONSTRUCTION DIVISION (408) 615-5600**

17 **SVP CREWS TO ITERSET ELECTRIC UTILITY SPLICE BOX**

18 **CUT INTO EMPTY 2-5" PRIMARY CONDUITS AND ROUTE INTO V-475 USING 1-5" x 30° x 5' R PVC BEND EACH CONDUIT. VERIFY EMPTY CONDUITS WITH LINE MAINTENANCE AND CONSTRUCTION DIVISION (408) 615-5600**

19 **BRACE POLE IF EXCAVATING WITHIN 5'-0" OF POLE**

20 **SVP CREWS TO RELOCATE EXISTING DOWNGUY AND ANCHOR AT DEVELOPERS EXPENSE. BILLING LETTER TO FOLLOW**

21 **DEVELOPER TO PROVIDE GATE WITH A DOUBLE HASP LOCKING DEVICE FOR A CITY PADLOCK. THE CITY REQUIRES INDEPENDENT ACCESS TO IT'S FACILITY AT ALL TIMES. CONTACT LINE MAINTENANCE AND CONSTRUCTION DIVISION (408) 615-5600 TO INSTALL A CITY PADLOCK**

22 **METERS TO BE ON THIS SIDE OF 12KV SWITCHGEAR**

23 **PULL - 2-SETS OF 1/0 AL TRI 15KV MH-123 FROM OR TO V-167**

24 **PULL - 2-SETS OF 1/0 AL TRI 15KV FROM MH-123 TO V-167 ONLY**

Exhibit "D" - Sample Title Block:

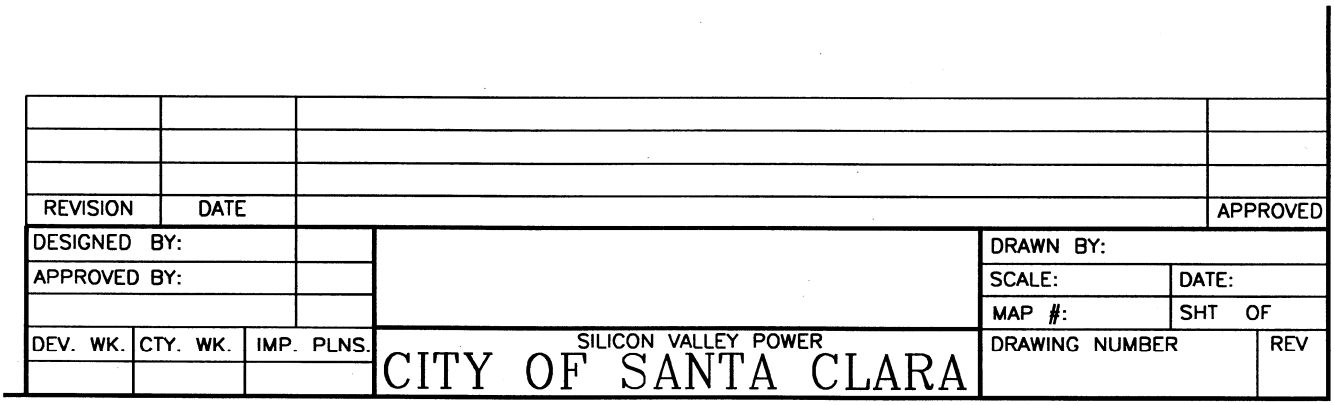
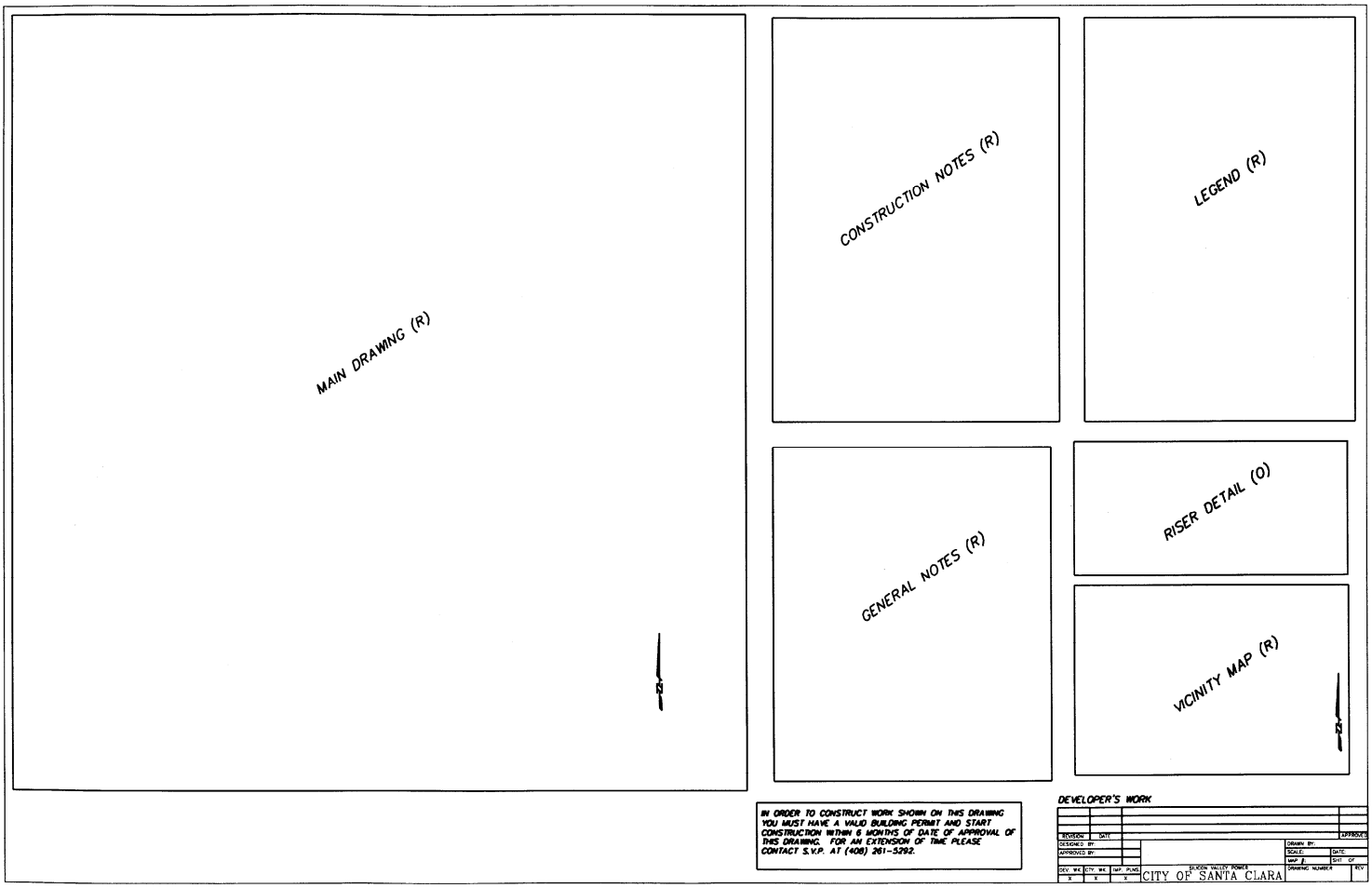
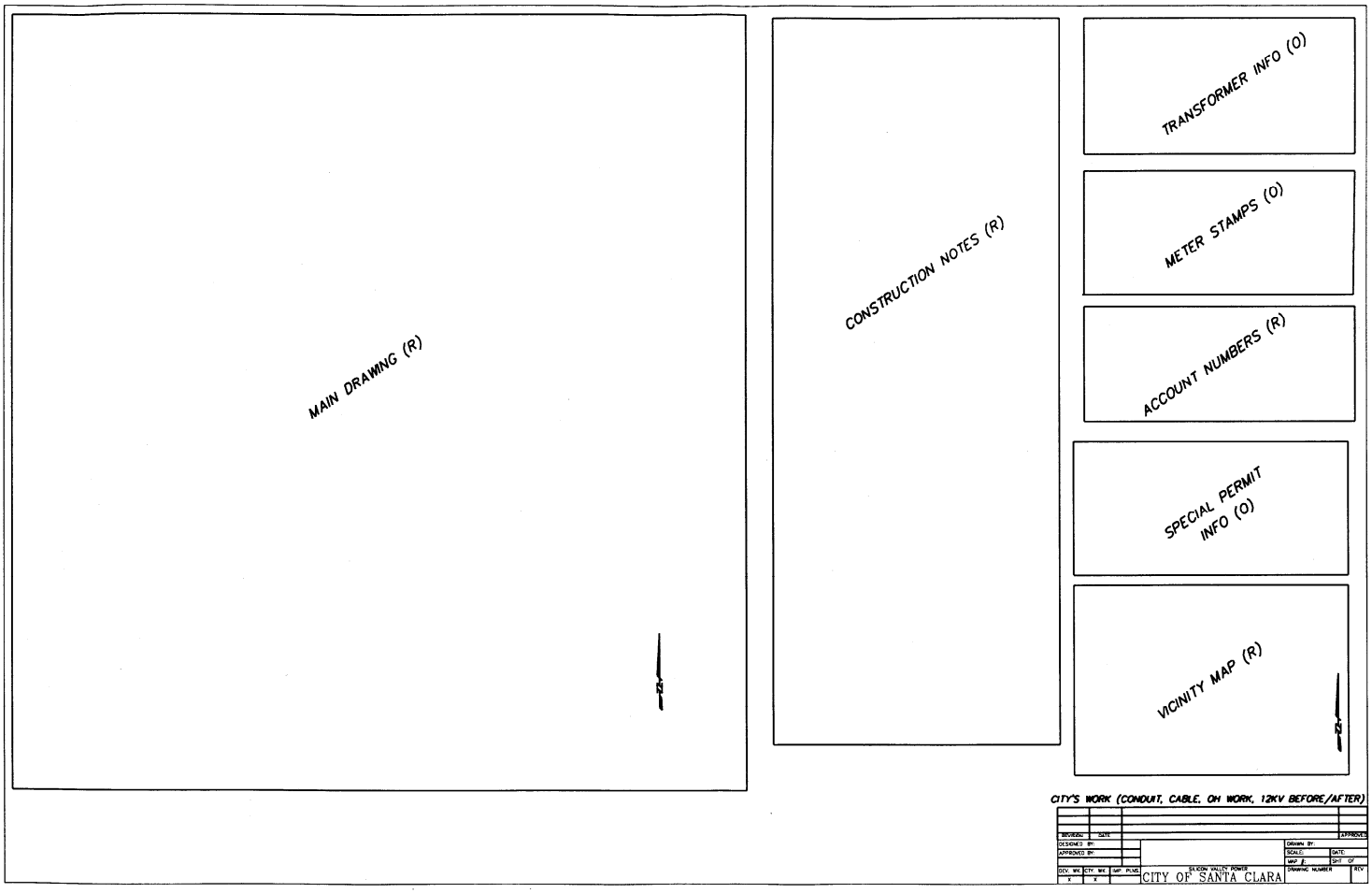


Exhibit "E" – Developer's Work Drawing Template:



(R) = Required
(O) = Optional

Exhibit "F" – City's Work Drawing Template:



(R) = Required
(O) = Optional