

Civil Engineering

Subdivision: Arcade Creek

Subject Area: Civil Engineering/CAD Grade Levels: 9-12 Date: 12/2/2009

Students will reproduce a subdivision map and then add details such as house footprint, water, sewer, and lights.

Materials Included in this Lesson

- General map of subdivision
- 3 county maps of area
- Sample set of professional plans
- Sample plot plan

Other Materials for this Lesson

- AutoCAD
- Internet access
- Sketch paper

Skills the Student will Learn

- use and understand bearings
- polar coordinates and polar snap
- arcs, chords, angular displacement
- extend, lengthen command
- concept of Public Utility Easements
- setup of sheets and layers
- Plan for easements and setbacks
- concepts of area: section, acre, lot size, computation
- Utilities: planning for and drawing schematics

Student Deliverables

- Subdivision map (1 per student)
- Model House plans: Blocks of right and left footprint (1 per student)
- Updated map with houses and driveways inserted (1 per team)
- Report on Utilities
- Final map with utilities inserted (1 per team)
- Plot plans (1 per student)

Length of Lesson: 15 Days

Activity One: Reproduce subdivision map: (5 days)

Day 1: Intro Civil Engineering: Surveying, utilities, easements, grading, roads, etc.

Template setup: Layers, Sheets, Dimensions, Text

Math skills: Polar coordinates with bearings as angle measurement

Maps: Look at official maps; Google map; Google earth

Day 2 & 3:

Finish drawing map:

AutoCAD commands: polar snap, extend, lengthen

Math skills: arcs, chords, angular displacement

Day 4: Documentation: Dimensions, notes, legends, symbols, etc.

Activity Two: House Plans (2 days)

Students will be placed in teams of 3 at the beginning of the project. Each student will draw the map described above. On day 2 they will be given the assignment of discovering a floor plan to use as a model in their subdivision. Stress that these houses must FIT on the given plots.

Discuss easements and setbacks. They can use house plans found in books, magazines, or on the internet. They will then draw a footprint of the model and make blocks of the right and left footprint.

Math Skills: Area – Section, Acre, Sq. footage, computing area

AutoCAD: Blocks, computing area

Vocabulary: Easements, Setbacks, Footprint, Section, Acre

Activity Three: Updated map (1 day)

Each team will:

- Choose one of their subdivision maps to use as a team map.
- Decide which houses go on the lots. All 6 footprints must be used.
- Put in the driveways

Review: Block, easements, setbacks

Discuss: Rationale for placing houses.

Activity Four: Final map with utilities inserted (5 days)

Each team will plan and draw the schematic plan for the water, sewer and street lighting of the subdivision.

- Discuss needs of utilities
- Study examples of schematics on professional plans
- Each student chooses one topic to study and develop (water, sewer or lighting)
- Research and report on their topic: Description of process, where placed, tools used, materials used, pertinent information for their drawing.

Take a field trip to Bishop Ranch after studying plans

Activity Five: Individual Plot Plans (2 days)

Each student will take one lot and develop a plot plan that shows where the house is located along with all the easements and setbacks and all appropriate dimensions.

Enrichment Suggestions

Take a field trip to a local neighborhood and looking at the infrastructure. I was able to get the plans for a neighborhood across the street from my school. After spending some time drawing the assigned sub-division, we spent a day looking at the professional plans and learning how to read where the utilities would be located. The next day we went across the street and explored the neighborhood. It was a good day of seeing exactly what the symbols on the maps indicated and how they related to what you would see in the yards and streets.

Student Resources

The legal maps are included. During my externship the engineers were able to go directly into the county online documents and reproduce the actual map for the 1988 subdivision as well as the 1910 document that the newer map was based on. Copies of these are in the “map” folder.

State Standards Met

<http://www.cde.ca.gov/ci/ct/sf/documents/ctestandards.pdf>

CTE standards at the above link.

- 3.0 Career Planning
- 4.0 Technology
- 5.0 Problem Solving
- 9.0 Leadership and Teamwork

Lesson Plan Relevance To Externship

I did my externship at Baker-Williams Engineering Group. The focus of their business is doing all the planning for developing a site: from surveying to drawing the plans to getting the plans through the approval process. I was able to go to a city/county planning meeting about one of their site developments. I visited a job site and I spent a lot of time studying plans they had already completed. All of this gave me a better understanding of what must go into developing a set of plans for a building site.

During the week I was there I showed them a site that I had assigned my students in the past. They helped me find the real site plan and the location of the subdivision in Sacramento. Up to that point, I did not even know if it was a real location! Now we can google map it and also look at the official maps. It lends some legitimacy to the project that it is based on an official map.

Rubric for the Arcade Creek Project

Student Deliverables	1 Exceeds Expectations	2 Meets Expectations	3 Approaches Expectations	4 Fails to meet Expectations
Subdivision map				
Model House plans				
Updated map				
Report on Utilities				
Final map				
Plot plans				

- Subdivision map (1 per student)
- Model House plans: Blocks of right and left footprint (1 per student)
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- Final map with utilities inserted (1 per team)
- Plot plans (1 per student)

6-881

PLAT OF
LOS ROBLES ESTATES
PORTIONS OF LOTS 9 & 10 AND PORTIONS OF LOS ROBLES BLVD. AND
ALVARADO STREET IN BLOCK A HAGGINWOOD SUBDIVISION NO. 5
BOOK 11 OF MAPS, MAP NO. 36 & 37, SACRAMENTO COUNTY RECORDS
CITY OF SACRAMENTO STATE OF CALIFORNIA

TASK ENGINEERING INC.
NOVEMBER, 1988

LEGAL DESCRIPTION:

LOTS 9 AND 10, BLOCK A OF HAGGINWOOD SUBDIVISION NO. 5, NORTH SACRAMENTO, IN BOOK 11 OF MAPS, MAP NO. 36 AND 37.

EXCEPTING THEREFROM ALL THAT PORTION OF LOTS 7, 8, 9 AND 10, BLOCK A, AS SHOWN ON THE MAP OF "HAGGINWOOD SUBDIVISION NO. 5, NORTH SACRAMENTO", RECORDED IN THE OFFICE OF THE RECORDER OF SACRAMENTO COUNTY, IN BOOK 11 OF MAPS, MAP NOS. 36 AND 37, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT NO. 10; THENCE, FROM SAID POINT OF BEGINNING ALONG THE WEST LINE OF SAID LOT NO. 10 NORTH 00° 05' 00" EAST 104.07 FEET; THENCE, CURVING TO THE LEFT ON AN ARC OF 506.27 FEET RADIUS, SAID ARC BEING SUBTENDED BY A CHORD BEARING NORTH 81° 31' 38" EAST 150.80 FEET; THENCE NORTH 72° 57' 44" EAST 135.37 FEET; THENCE, CURVING TO THE RIGHT ON AN ARC OF 608.07 FEET RADIUS, SAID ARC BEING SUBTENDED BY A CHORD BEARING NORTH 78° 46' 00" EAST 122.96 FEET; THENCE, NORTH 84° 34' 06" EAST 323.00 FEET; THENCE, CURVING TO THE RIGHT ON AN ARC OF 1102.00 FEET RADIUS SAID ARC BEING SUBTENDED BY A CHORD BEARING NORTH 85° 37' 17" EAST 40.52 FEET TO A POINT ON THE EAST LINE OF SAID LOT 7; THENCE, ALONG SAID EAST LINE SOUTH 27° 44' 30" EAST 30.34 FEET; THENCE, SOUTH 88° 39' 00" WEST 98.46 FEET; THENCE, SOUTH 89° 31' 17" WEST 56.35 FEET; THENCE, SOUTH 74° 47' 00" WEST 41.91 FEET; THENCE, SOUTH 08° 45' 30" EAST 60.99 FEET TO A POINT ON THE SOUTH LINE OF SAID LOT 7; THENCE, ALONG THE SOUTH LINE OF SAID LOTS 7 AND 8 SOUTH 87° 29' 30" WEST 206.93 FEET; THENCE, ALONG THE SOUTH LINE OF SAID LOTS 8, 9 AND 10 SOUTH 80° 18' 30" WEST 411.85 FEET TO THE POINT OF BEGINNING. AND CONTAINING 1.927 ACRES MORE OR LESS.

VACATIONS:

PORTIONS OF LOS ROBLES BOULEVARD ARE HEREBY VACATED AS SHOWN HEREON.

OWNER'S STATEMENT:

THE UNDERSIGNED HEREBY CONSENTS TO THE PREPARATION AND RECORDING OF THIS PLAT OF LOS ROBLES ESTATES AND OFFERS FOR DEDICATION AND DOES HEREBY DEDICATE TO ANY AND ALL PUBLIC USES THE COURT SHOWN HEREON AND ALSO OFFERS FOR DEDICATION AND DOES HEREBY DEDICATE TO SPECIFIC PURPOSES THE FOLLOWING:

(A) EASEMENTS FOR PLANTING AND MAINTAINING TREES, INSTALLING AND MAINTAINING ELECTROLIERS, WATER AND GAS PIPES, AND FOR UNDERGROUND WIRES AND CONDUITS FOR ELECTRIC, CABLE TELEVISION AND TELEPHONE SERVICES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS STRIPS OF LAND 12.5 FEET IN WIDTH LYING CONTIGUOUS TO THE COURT SHOWN HEREON.

(B) RIGHT-OF-WAY AND EASEMENTS FOR INSTALLATION AND MAINTENANCE OF WATER, GAS, SEWER AND DRAINAGE PIPES, AND FOR POLES AND OVERHEAD AND UNDERGROUND WIRES AND CONDUITS FOR ELECTRICAL, CABLE TELEVISION AND TELEPHONE SERVICES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS THOSE STRIPS OF LAND LYING BETWEEN THE REAR AND OR SIDELINES OF LOTS AND LINES SHOWN HEREON AND DESIGNATED "PUBLIC UTILITY EASEMENT". (P.U.E.)

(C) EASEMENT FOR CONSTRUCTING AND MAINTAINING CENTRALIZED MAIL DELIVER BOXES, PEDESTALS, SLABS. TOGETHER WITH ANY AND ALL APPURTENANCES THERETO INCLUDING PEDESTRIAN ACCESS FOR DELIVERY AND RECEIPT OF MAIL ON, OVER, UNDER AND ACROSS STRIPS OF LAND FIVE (5) FEET IN WIDTH, LYING CONTIGUOUS TO THE PUBLIC BOULEVARD AND COURT SHOWN HEREON.

CONSTRUCTION & MARKETING ASSOC., INC.
A CALIFORNIA CORPORATION

BY: Blaine Hansen
BLAINE HANSEN, PRESIDENT

CORPORATION ACKNOWLEDGEMENT:

STATE OF CALIFORNIA, COUNTY OF SACRAMENTO, ON 10-17, 1988, BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID STATE AND COUNTY, PERSONALLY APPEARED BLAINE HANSEN KNOWN TO ME (OR PROVEN ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PRESIDENT OF THE CORPORATION THAT EXECUTED THE WITHIN INSTRUMENT ALSO KNOWN TO ME TO BE THE PERSON WHO EXECUTED IT ON BEHALF OF SUCH CORPORATION; AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE WITHIN INSTRUMENT PURSUANT TO ITS BY-LAWS OR A RESOLUTION OF ITS BOARD OF DIRECTORS.

WITNESS MY HAND AND OFFICIAL SEAL.



W. M. Bengochea
W. M. Bengochea
NOTARY PUBLIC IN AND FOR THE
STATE OF CALIFORNIA
My Commission
EXPIRES 3/31/89



ENGINEER'S STATEMENT:

I HEREBY CERTIFY THAT THIS PLAT OF LOS ROBLES ESTATES MADE UNDER MY DIRECTION IN JANUARY, 1988 IS TRUE AND COMPLETE AS SHOWN THAT THE MONUMENTS WILL BE THE CHARACTER AND WILL OCCUPY THE POSITIONS INDICATED AND WILL BE SET BEFORE DECEMBER, 1989 OR UPON COMPLETION OF THE REQUIRED SUBDIVISION IMPROVEMENTS AND THAT SAID MONUMENTS WILL BE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

DATED: 10-17-88

Terry A. Rose
TERRY A. ROSE RCE 21640

CITY ENGINEER'S STATEMENT:

I HEREBY CERTIFY THAT I HAVE EXAMINED THIS PLAT OF LOS ROBLES ESTATES AND FOUND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP SUBMITTED TO THE CITY PLANNING COMMISSION OF THE CITY OF SACRAMENTO. THAT ALL THE PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH AND THAT I AM SATISFIED THAT SAID PLAT IS TECHNICALLY CORRECT.

DATED: 12-1-88

J. K. Smiley
ENGINEERING DIVISION MANAGER OF
THE CITY OF SACRAMENTO

TRUSTEE STATEMENT:

STEWART TITLE OF SACRAMENTO, AS TRUSTEE UNDER THE DEED OF TRUST RECORDED IN BOOK 88-03-11 OF OFFICIAL RECORDS AT SERIES NUMBER 51562 & 51563.

PRESIDENT ALT. SECRETARY

CORPORATE ACKNOWLEDGEMENT:

STATE OF CALIFORNIA)
COUNTY OF SACRAMENTO) SS.
ON THIS 25th DAY OF October, 1988, BEFORE ME,
FOR SAID COUNTY, PERSONALLY APPEARED ROBERT M. GOETTLICH AND KNOWN TO ME TO BE THE PRESIDENT, AND SECRETARY RESPECTIVELY, OF STEWART TITLE OF SACRAMENTO A CALIFORNIA CORPORATION, THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.



W. M. Bengochea
W. M. Bengochea
NOTARY PUBLIC IN AND FOR THE
COUNTY OF SACRAMENTO, STATE
OF CALIFORNIA
My Commission
EXPIRES 3/31/89

CITY CLERK'S STATEMENT:

I HEREBY CERTIFY THAT THE CITY COUNCIL OF THE CITY OF SACRAMENTO HAS APPROVED THIS PLAT OF LOS ROBLES ESTATES AND HAS ACCEPTED IN BEHALF OF THE PUBLIC ALL THE LANDS, RIGHTS OF WAY AND EASEMENTS HERON OFFERED FOR DEDICATION.

DATED: 11-30-88

James J. Mason
ACTING CITY CLERK

RECORDER'S STATEMENT:

ACCEPTED FOR RECORD AND RECORDED IN THE OFFICE OF THE RECORDER OF SACRAMENTO COUNTY IN BOOK 188 OF MAPS, MAP NO. 9 THIS 2nd DAY OF December, 1988 AT 11 HOURS 53 MINUTES A.M. TITLE TO THE LAND INCLUDED IN THIS SUBDIVISION BEING VESTED AS PER CERTIFICATE NO. 5108 ON FILE IN THIS OFFICE.

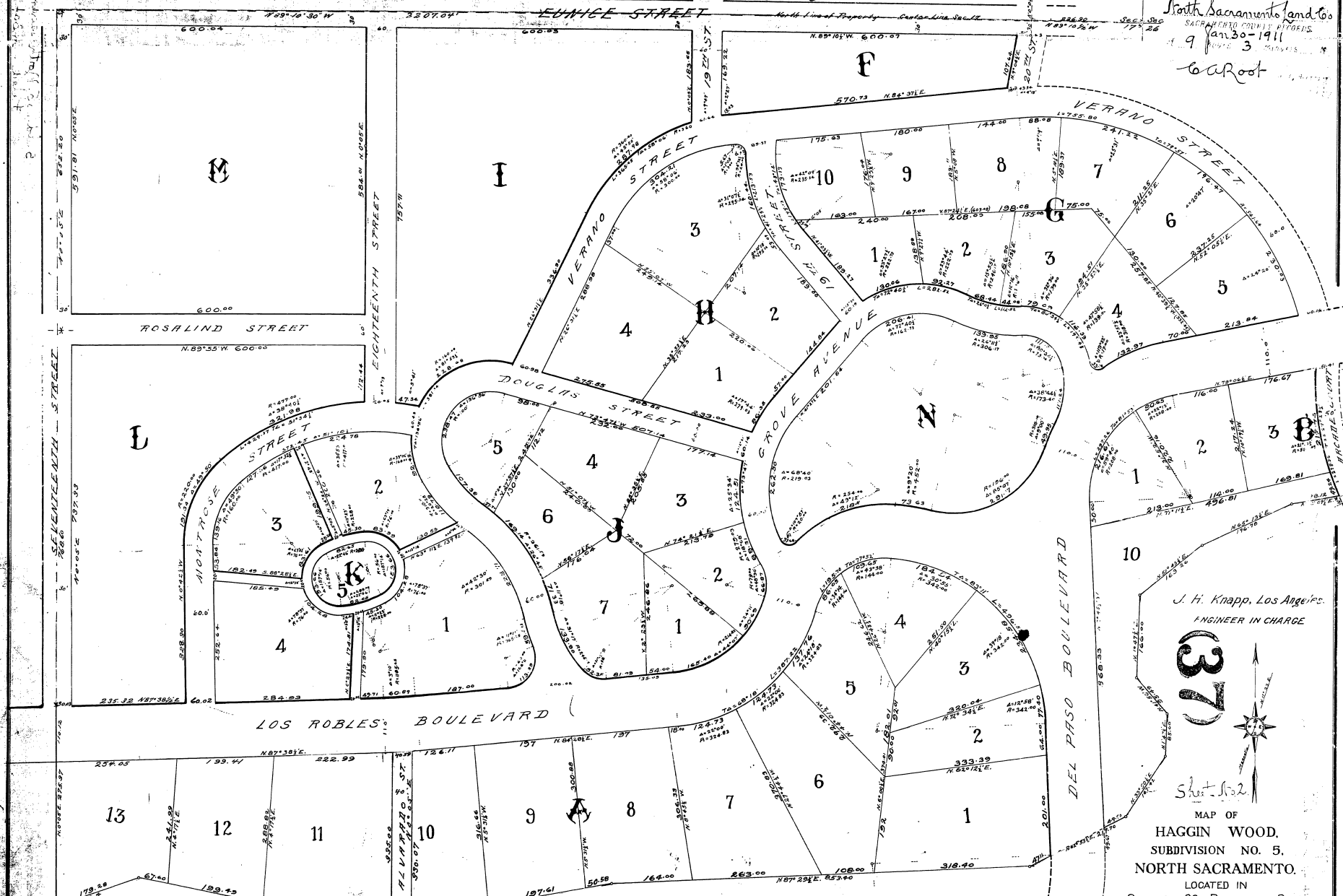
Joyce Russell Smith
RECORDER OF SACRAMENTO COUNTY

BY: J. Hanson
DEPUTY

272514

N. B. For details see Sheet No. 1
 Subd. No. 5, North Sacramento
 CARROT Recorder

FILED AT REQUEST OF
 South Sacramento Land Co.
 SACRAMENTO COUNTY, CALIFORNIA
 Jan 30 - 1911
 CARROT



Note:
 All bearings are true, given to degrees ($^{\circ}$), minutes ($'$) and fractions of one minute. Distances are given in feet, with fractions of one foot, and are rounded to the nearest hundredth of a foot. All lot areas are given in square feet, with fractions of one square foot, and are rounded to the nearest hundredth of a square foot. Boundaries shown are as shown.

J. H. Knapp, Los Angeles
 ENGINEER IN CHARGE

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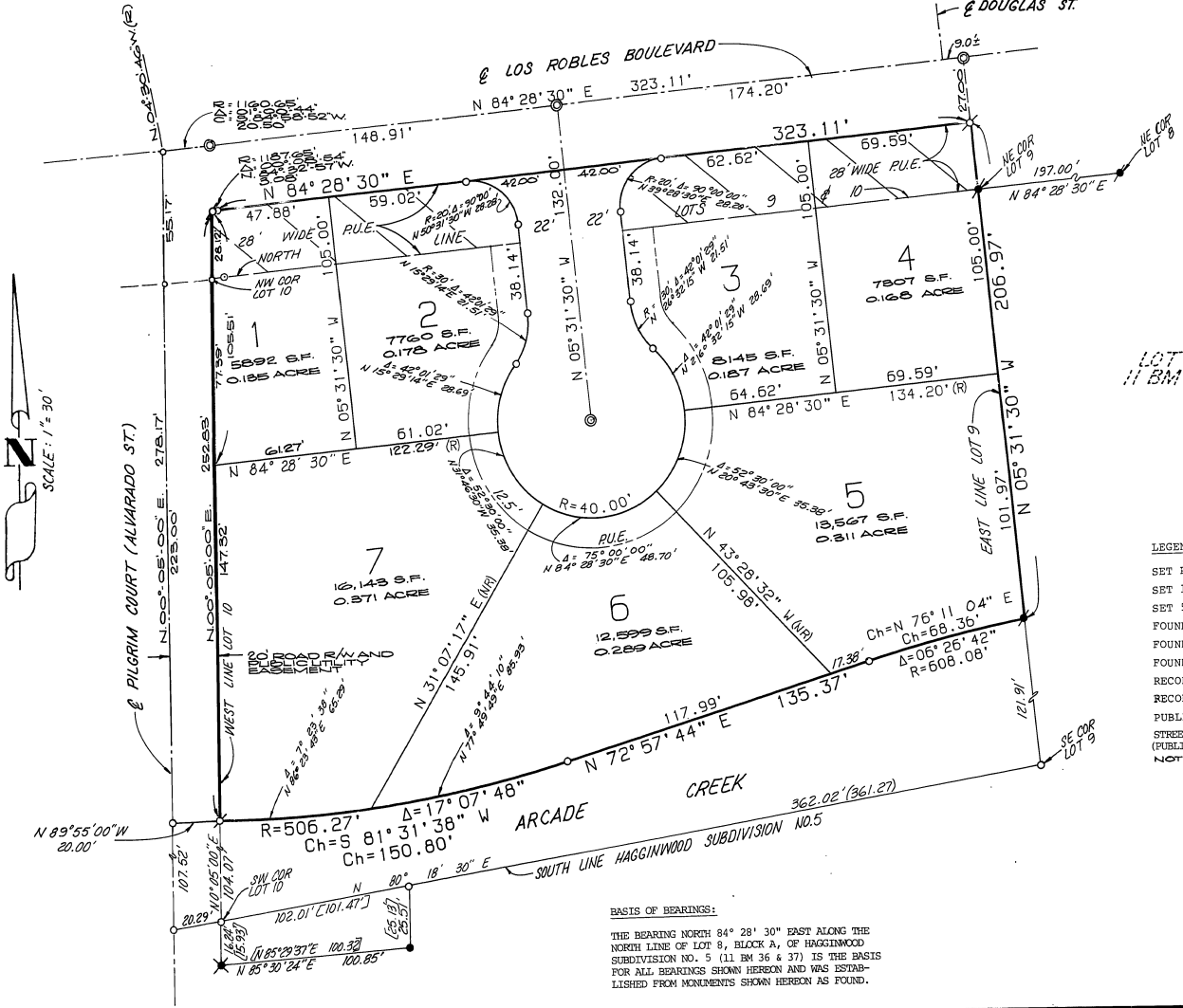
Sheet No. 2

MAP OF
 HAGGIN WOOD,
 SUBDIVISION NO. 5,
 NORTH SACRAMENTO,
 LOCATED IN
 SECTION 26, RANCHO DEL PASO,
 SACRAMENTO COUNTY, CALIFORNIA

SCALE 1" = 100 FT. DECEMBER, 1910.
 TWO SHEETS SHEET NO. 2.

PLAT OF
LOS ROBLES ESTATES
 PORTIONS OF LOTS 9 & 10 AND PORTIONS OF LOS ROBLES BLVD. AND
 ALVARADO STREET IN BLOCK A HAGGINWOOD SUBDIVISION NO. 5
 BOOK 11 OF MAPS, MAP NO. 36 & 37, SACRAMENTO COUNTY RECORDS
 CITY OF SACRAMENTO STATE OF CALIFORNIA

TASK ENGINEERING INC.



NOTES:

1. A SOILS REPORT FOR THIS SUBDIVISION WAS PREPARED BY **TESTING ENGINEERS INC.** IN FEBRUARY, 1988. A COPY OF THIS REPORT IS AVAILABLE FOR PUBLIC INSPECTION AT THE OFFICE OF THE SACRAMENTO CITY BUILDING INSPECTOR.
2. THIS SUBDIVISION CONTAINS 1.927 ACRES, GROSS.

LEGEND:

- SET PK NAIL & SHINER
- SET 1" IRON PIPE LS 5537
- SET 5/8" REBAR CAPPED LS. 5537
- FOUND 3/4" IRON PIPE L.S. 2457
- FOUND RAILROAD SPIKE (NO TAG)
- FOUND 1/2" IRON PIPE (NO TAG)
- RECORD PER 11 BM 36 & 37
- RECORD PER 700304 OR 56
- PUBLIC UTILITY EASEMENT
- STREET RIGHT-OF-WAY VACATED ON THIS MAP. (PUBLIC UTILITY EASEMENTS RESERVED & EXCEPTED)
- NOTHING FOUND, NOTHING SET

BASIS OF BEARINGS:
 THE BEARING NORTH 84° 28' 30" EAST ALONG THE NORTH LINE OF LOT 8, BLOCK A, OF HAGGINWOOD SUBDIVISION NO. 5 (11 BM 36 & 37) IS THE BASIS FOR ALL BEARINGS SHOWN HEREON AND WAS ESTABLISHED FROM MONUMENTS SHOWN HEREON AS FOUND.