

September 25, 2019

City of Placerville  
3101 Center Street  
Placerville, CA 95667



**Subject: Cedar Ravine Sewer Replacement Project Scoping Memo – Final Draft**

Dear City of Placerville Staff,

The City of Placerville (City) desires to remove the sewer main from Cedar Ravine Creek that runs along the southwest edge of Cedar Ravine Road and replace any aging sewer facilities in the road. A previous project replaced the sewer system upstream of the project down to Darlington Avenue. This project includes the removal of and sewer mains and services in the creek and replacement with a new sewer main and services where necessary.

The purpose of this memo is to provide an evaluation of the existing conditions, present design solutions, and assist the City in selecting a preferred design alternative. Due to the complexity and challenges associated with this project, this memo provides a high-level scoping effort that determines the scope of the rehabilitation necessary, verifies technical feasibility of the design alternatives, and provides cost information for each alternative.

The proposed design solutions presented in the memo were determined with the following project goals in mind:

- Remove sewer main and sewer lateral connections from Cedar Ravine Creek
- Fix any deficiencies in the existing sewer facilities identified in inspections and surveys
- Provide new simplified, reliable, and maintainable sewer facilities for Public and City Staff
- Provide improvements that are cost-efficient and built to last
- Minimize impact to public, residences, businesses, and hospital during construction and future maintenance
- Provide adequate protection from sewer contamination of stormwater
- Minimize any potential impacts to the hydraulics of the existing creek
- Provide improvements that are compatible with future improvements to Cedar Ravine Road including the undergrounding of the creek into a box culvert system.

Investigation of the existing conditions was conducted in August through October of 2019 and included the following work:

- Utility Mapping based on maps acquired from utility providers
- Utility locating and markings using geophysical equipment
- CCTV sewer main and manhole inspections
- Field Survey using conventional survey methods
- Field Survey using UAV to gather aerial LiDAR data and orthographic photos
- Site walks and site photos
- Record Drawings provided by the City

The investigation of the existing conditions showed that there are four distinct sections with unique existing conditions:

1. Pacific Street to Victor Lane (STA 5+00 to 9+00) – Existing Sewer in Creek Behind Homes
2. Victor Lane to Marshall Way (STA 9+00 to 12+30) – Existing Sewer in Creek Underneath Homes or Under Front Yard
3. Marshall Way to 3140 Cedar Ravine (STA 12+30 to 15+50) – Existing Sewer in Creek in Front Yard
4. 3140 Cedar Ravine to Darlington/Wall (STA 15+50 to 21+00) – Existing Sewer in Front Yard

Sections 1 and 2 above have similar challenges and this memo proposes a sole alternative improvement that provides a solution for both of these sections. Section 3 and 4 can also be grouped together because they have similar challenges, with the creek in front of the buildings. For these Sections two alternative improvements are presented and analyzed in this memo. This memo details the proposed improvement for these Sections and provides a cost estimate and exhibit for each.

Permitting for the proposed work, including the removal of the existing sewer line in the creek and installation of new sewer services crossing, will require a Standard Streamed Alteration Agreement with the California Department of Fish and Game. The work will also require a 401 Water Quality Certification permit for activities that may result in a discharge into waters of the United States. It is also assumed the work associated with this project will receive a Notice of Categorical Exemption for the CEQA and fall into the category of existing facilities repair under Section 15301.

### Sections 1 & 2 (STA 5+00 to 12+30) – Pacific Street to Marshall Way

#### Existing Conditions

Section 1 is from Pacific Street to Victor Lane where the existing sewer line is in the creek which runs behind the buildings. Section 2 is from Victor Lane to Marshall Way where the existing sewer line is in the creek which is located underneath the buildings or in the front yard and is not easily accessible.

Throughout Sections 1 and 2 there are two sewer mains including a 6" diameter cast iron pipe located in the creek and a larger 10" lined vitrified clay pipe (VCP) main in the road. The limits within Section 1 and 2 also include the side streets of Pacific Street, Thompson Street, and Victor Street. Sheet 1 of the Scoping Exhibit included as Attachment A shows the existing conditions including utilities found in these two sections.

CCTV results for Sections 1 and 2 show that the sewer main on Cedar Ravine Road is in an acceptable condition with no major deficiencies or capacity issues and has a newer pipe lining installed as part of a past project. Inspection results for the sewer mains on Thompson Street and Victor Street show no major deficiencies. On Pacific Street the CCTV inspection identified approximately 50 LF of existing 10" VCP sewer main that is recommended for replacement. This replacement is necessary in order to abandon the connection with the 6" sewer main



Sections 1 & 2 – Cedar Ravine Creek running under the building and services laterals connected to the 6" CIP sewer main in the creek.

in the creek. In addition, this VCP pipe is old and connects to newer PVC pipe. The proposed improvements include replacement of this VCP pipe with new PVC pipe.

Manhole inspection results for Sections 1 and 2 did not show any major deficiencies that require replacement or new structural linings.

In Sections 1 and 2 the buildings east of the road have sewer laterals that connect to the sewer main located within Cedar Ravine Road. The buildings west of the road have service laterals that connect to two different locations - either the 6" sewer main in the creek or the 10" sewer main in the road. Site investigations show that of the 13 total buildings west of the creek, approximately 8 of these buildings have sewer service laterals that connect to the 6" sewer main in the creek. A majority of the buildings with connections to the 6" sewer main in the creek appear to have more than one sewer service connection and may also have illegal storm drain connections to the sewer line.

There appears to be 5 buildings west of the road that used to have sewer laterals that connected to the sewer in the creek and have since been rerouted to the existing 10" sewer main in the road and abandoned at the creek. A majority of these re-routed service laterals are equipped with sewer cleanouts near the back of sidewalk.

#### Recommended Improvements

From our perspective, the recommended solution for Sections 1 and 2 is to re-route the service laterals for the 8 buildings that currently connect to the existing 6" sewer main in the creek and switch them to sewer to the existing 10" sewer main on Cedar Ravine Road. This is a proven solution because 5 of the 13 buildings located west of the road already have service laterals that have been rerouted. In addition, analysis was done to verify that there is adequate fall between the building pad and the existing 10" sewer main in the road to allow the rerouting of the sewer laterals to the sewer main in the road.

The work to reroute sewer laterals for the remaining 8 homes requires the City to coordinate with residents and perform work on private property. The improvements include the following:

- Abandon the existing sewer lateral connections to the sewer main in the creek and where necessary fill/repair existing pipe penetrations through existing box culvert.
- Reroute the existing sewer laterals to a new clean-out in the front yard. This requires installation of new service lateral, either by bore or open trench method, that is routed under the building's raised foundation or along the side yard.
- Continue the installation of new sewer lateral from the cleanout to the existing sewer main in the creek.
- Surface restoration associated with any trenching or excavation including restoration of pavement, concrete, and landscaping.
- Demolish and remove the existing sewer facilities in the creek including the main and any abandoned branches no longer in service.

The 8 homes that require new sewer laterals within Sections 1 and 2 are shown in Table 1 on the next page.

**Table 1: Lots in Sections 1 and 2 (STA 5+00 to 12+30) Requiring Re-routing of Sewer Laterals**

Address	Homes(s) Served	Notes
980 Pacific St	1	Existing sewer lateral connection is in box culvert in front yard.
3062 Cedar Ravine	1	Existing sewer lateral connection is in creek under home and includes several branches connecting under home and into back yard.
3066 Cedar Ravine	3	3 separate existing sewer lateral connections that are all connected in creek located between homes. The new lateral for the home south of the creek requires sewer lateral crossing over the creek or a crossing under the creek using a grinder pump.
3088 Cedar Ravine	1	Existing sewer lateral connection is in creek under backside of home.
3098 Cedar Ravine	1	Existing sewer lateral connection is in creek under middle of home.
3106 Cedar Ravine	1	Existing sewer lateral connection is in box culvert in front yard.

Sheet 1 of the Scoping Exhibit in Attachment A shows the recommended improvement for Sections 1 and 2 including a Plan and Typical Sections. The estimated total project cost for these improvements including Hard Costs (construction plus 30% contingency) and Soft Costs (design, construction management, and administration) is \$677,040. The Engineer’s Estimate of Probable Cost for Sections 1 and 2 be found as Estimate #1 in Attachment B.

**Sections 3 & 4 (STA 12+30 to 21+00) – Marshall Way to Darlington/Wall**

Existing Conditions

Section 3 is from Marshall Way to 3140 Cedar Ravine where the existing 6” sewer main is installed in the creek. Section 4 is from 3140 Cedar Ravine to Wall Street/Darlington Avenue where the existing 6” sewer main is located in the front yards and not within the creek. Throughout Sections 3 and 4 there are two sewer mains including a 6” diameter cast iron pipe located in the creek or front yards and a larger 10” vitrified clay pipe (VCP) main in the road. All of the buildings west of Cedar Ravine Road have service laterals that connect to the existing 6” sewer main in the creek or front yard and all the buildings east of the road have service lateral that connect to the 8” or 10” sewer main in the road. The project limits within Section 3 and 4 also include the side streets of Marshall Way, Wall Street, and Darlington Ave.



Sections 3 & 4 – Cedar Ravine Creek running in front of buildings and under driveway crossings with services laterals connected to the 6” CIP sewer main in the creek. Creek has rock bottom and trees.

In Section 3 the existing sewer main located in Cedar Ravine Road is a 10" lined Vitriified Clay Pipe (VCP). CCTV inspections do not identify any major deficiencies with this main. CCTV results for Section 4 shows the main in the road is an unlined 8" VCP and does not have any significant deficiencies or capacity issues but does have one spot with minor root intrusion near an existing lateral connection. The inspection of the pipes on Marshall Way, Darlington Ave, and Wall Street did not show any deficiencies or capacity issues but CCTV did show that a majority of the flows appear to come from the Hospital's connections at Marshall Way and Darlington Street.

Manhole inspection results for Sections 3 and 4 did show minor deficiencies at 2 manholes, one at the intersection of Marshall Way and the other at Darlington Avenue/Wall Street. The deficiencies are associated with improper flowlines and pipe connections. Rehabilitation at the bottom of the manholes including rechanneling and pipe trimming is recommended to establish proper flowlines.

Sheet 2 and 3 of the Scoping Exhibit found in Attachment A shows the existing conditions including the existing utilities found in these two sections.

#### Recommended Improvement Alternatives

After review and analysis of the existing conditions, we feel there are two alternative improvements for Section 3 and 4:

Alternative A - Install a new 6" sewer collector, new 4" service laterals, and new 48" manholes in the front yard. Install sewer collector crossing over creek to connect to the existing 10' main in road. Acquire easement for sewer collector in front yards.

Alternative B - Remove existing 10" main in road 60" manholes and replace in-place with deeper 10" main and 60" manholes. Install new sewer laterals under creek to connect to new 10" main in road.

#### Alternative A

Alternative A includes the installation of a 6" public sewer collector line through front yards within a new 10' wide public utility easement. Installation of a sewer collectors allows the existing sewer laterals to all collect into one sewer line in the front yards and eliminates the need to have several sewer laterals crossing the creek. This Alternative is shown on Sheet 2 in Plan and with Typical Sections.

The estimated total project cost for these improvements including Hard Costs (construction plus 30% contingency) and Soft Costs (design, construction management, and administration) is \$1.92 million. The Engineer's Estimate of Probable Cost can be found as Estimate #2 in Attachment B.

Listed below are the advantages and disadvantages to Alternative A:

**Alternative A Advantages:**

Lower Total Project Cost than Alternative B.

Does not require trenching or boring through rock at bottom of creek or near existing bridge crossings at multiple locations.

Minimizes impact to nearby residents during construction and has shorter duration of construction.

Minimizes utility service interruptions and service lateral replacement to only those on the creek side of the road.

Minimizes utility service interruptions required during construction.

Minimizes potential sources for sewer contamination of creek by having only one crossing over creek instead of multiple service crossings.

Does not require extensive tree or root removal in or around creek.

Minimizes bypass pumping of sewer main on Cedar Ravine Road during construction.

Minimizes environmental permitting requirements required for work near creek.

Does not require full road closure or traffic control that significantly impacts emergency vehicles' access to Marshall Hospital.

**Alternative A Disadvantages:**

Requires coordination with owners and acquisition of new 10' wide sewer utility easement in the front yard.

Requires installation and maintenance of public sewer facilities in front yards.

Does not consolidate sewer facilities into one main line on Cedar Ravine Road.

Access to proposed facilities requires coordination with owners and access through private property.

The close vicinity of existing trees to the proposed public sewer collector may create future issues with root intrusion.

The sewer facilities in front yards, including manholes, have potential to create odor near homes.

Requires removal and replacement of box culvert at sewer crossing location.

May require water services relocations in front yards to avoid conflicts with new sewer line.

Sewer crossing over creek has the potential to impact creek hydraulics

**Alternative B**

Alternative B involves the removal of the existing 10" VCP sewer line and replacement in-place with a new 10" PVC sewer main that is up to 4.5' deeper. The new sewer main is required to be deeper than existing because it allows the sewer laterals on the opposite side of the creek to cross under the creek and drain via gravity to the sewer main on Cedar Ravine Road. The existing sewer main in the road is not deep enough to allow the sewer laterals to cross under the creek. This Alternative is shown on Sheet 2 in Plan and with Typical Sections.

The estimated total project cost for these improvements including Hard Costs (construction plus 30% contingency) and Soft Costs (design, construction management, and administration) is \$4.11 million. The Engineer's Estimate of Probable Cost can be found as Estimate #3 in Attachment B.

Listed below are the advantages and disadvantages to Alternative B:

**Alternative B Advantages:**

Does not require new 10' wide utility easement and sewer facilities in front yard.

Does not require installation and maintenance of public sewer facilities in front yards.

Simplifies system by consolidating all sewer laterals to one sewer main on Cedar Ravine Road.

Access to proposed facilities does not require coordination with owners or access through private property.

Does not require removal and replacement of existing box culvert at sewer crossing over creek.

Reduces risk of having odors near homes caused by sewer facilities in front yards.

Sewer crossings under creek should not impact creek hydraulics.

Minimizes water service relocations.

**Alternative B Disadvantages:**

Higher Total Project Cost than Alternative A.

Involves trenching or boring through rock at bottom of creek or near existing bridge crossings at multiple locations.

Involves deep trenching in the road at depth where rock may be encountered.

Greater impacts to nearby residents during construction and longer construction duration than Alternative A.

Requires utility service interruptions and service lateral replacement on both sides of road not just creek side.

Traffic control on Cedar Ravine Road will be required for construction and future maintenance.

Traffic control may require full road closure and impacts emergency vehicles' access to Marshall Hospital.

Creates potential for sewer contamination of creek having several sewer laterals crossing under creek.

Requires tree and root removal in or around creek

Requires bypass pumping of sewer main in Cedar Ravine Road during construction.

Requires environmental permitting requirements due to construction and new facilities under and near creek.

In comparison, Alternative A has downsides because it requires acquisitions of new front yard sewer easement, creation of a new public facility in the front yard, and construction in front yards but is significantly less costly and less construction impacts than Alternative B. Meanwhile Alternative B is significantly more costly, has greater construction impacts, and includes more risks associated with hard rock excavation, tree removal, and additional environmental permitting required for sewer laterals crossing under the creek. Both Alternatives prepare the City for future work on Cedar Ravine Road and in the creek, including the installation of box culverts and widening of the road.

## Other Alternatives

A third alternative was analyzed for Sections 3 and 4. This alternative involved the installation of a new 6" main in-parallel to the existing 10" main and include new 48" manholes and new sewer laterals under creek. This alternative is similar to Alternative B because it involves the installation of a new deep sewer main in Cedar Ravine Road but does not include the removal of the existing sewer main in the road. This alternative was not detailed in this memo due to constructability and feasibility concerns. These concerns are rooted with the fact that the new deeper main would have to be located between the existing water and sewer lines and would require deep trenching under the existing sewer main. In addition, in Section 4 (STA 15+50 to 21+00) there is not enough room in the road to install a new 6" main in-parallel to the existing 10" main while maintaining proper horizontal clearance from existing water and sewer utilities.

## Conclusion

After investigation and review of the existing conditions the project limits were broken into four sections and proposed improvements were developed for each section. The Scoping Exhibit in Attachment A shows the existing conditions and proposed improvements for all four Sections.

For Sections 1 and 2, with the creek under or behind the buildings, the proposed improvement is to reroute the service laterals that connect to the creek to the existing sewer main in the road. The total estimated project cost for this improvement is \$677,040.

For Sections 3 and 4, where the creek is in front of the buildings, two alternative improvements were presented. Both alternatives have advantages and disadvantages outlined in this memo. Alternative A is least costly with a total project cost estimated at \$1.92 million but involves installing a new public front yard sewer collector that requires a new utility easement. Alternative B involves removing and replacing the existing sewer main in the road without the need for a new easement but is more costly with a total project cost of \$4.11 million.

The Engineer's Estimate of Probable Costs found in Attachment B also includes a Cost Estimate Summary. The Cost Estimate Summary shows Total Project Costs in 2020 for Section 1 through 4 and also projects the costs through 2023 assuming a 5% annual cost increase. This summary shows that if the City selects Alternative A the total project costs for Section 1 to 4 is \$2.60 million. The summary also shows that if Alternative B is selected the total project cost in the year 2021 is \$4.78 million.

For phasing purposes, the work can be broken into 2 phases, one for Sections 1 and 2 and one for Sections 3 and 4. The work to install new facilities can be sequenced in a manner that allows either phase of work to take place first, as long as the existing sewer main and services in the creek are abandoned and the new sewer services and main are in service.

The next step for the scoping of this project is for the City to use this memorandum with the cost estimates and exhibits to select their preferred alternative improvement.

Sincerely,



Ryan Ruddick, PE

## **Attachments**

- Attachment A – Scoping Exhibit
- Attachment B – Engineer’s Estimates of Probable Cost

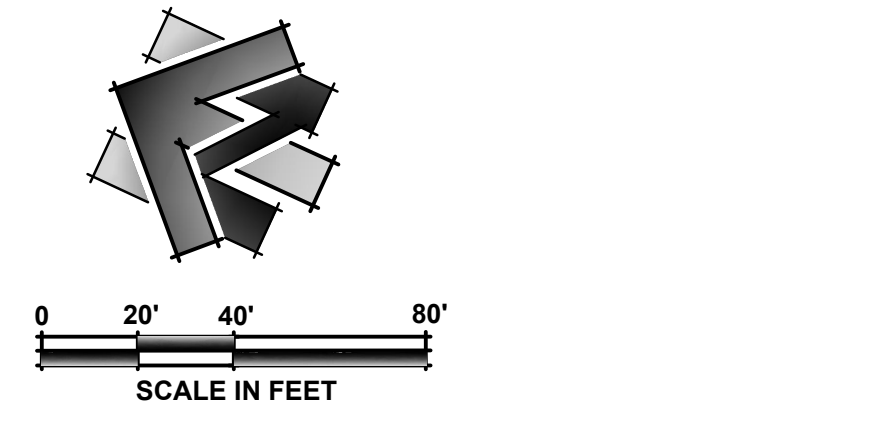
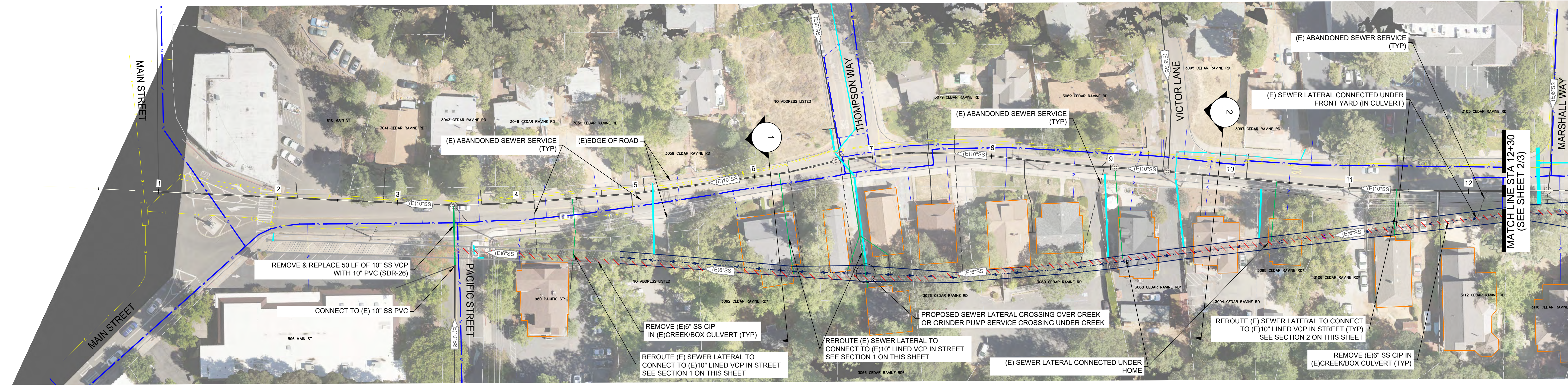
## **Attachment A – Scoping Exhibit**

A-1: Scoping Exhibit with Orthographic Image

A-2: Scoping Exhibit without Orthographic Image

Attachment A-1

Scoping Exhibit with Orthographic Image

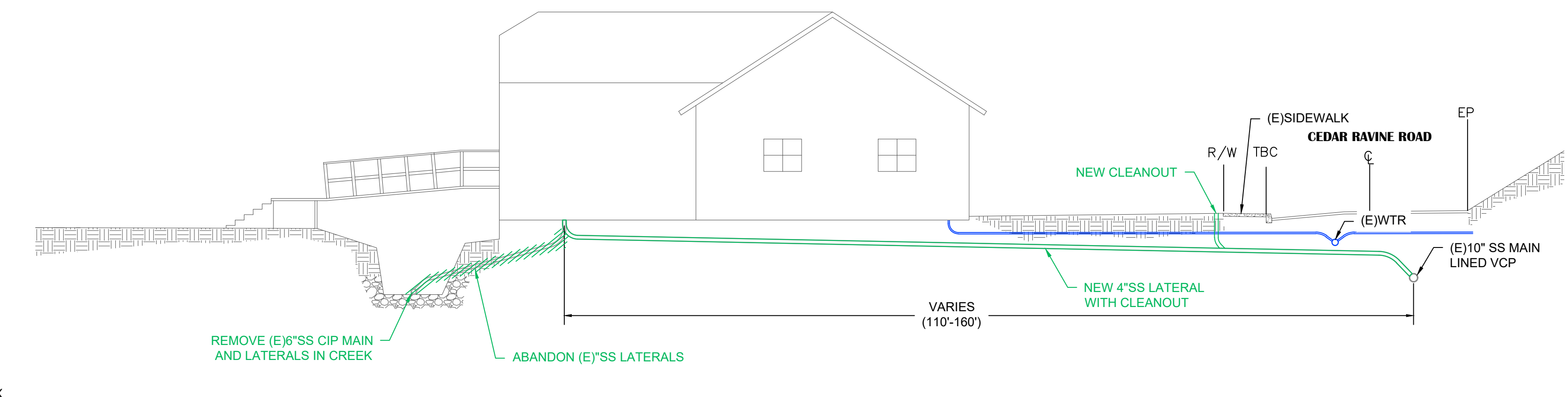


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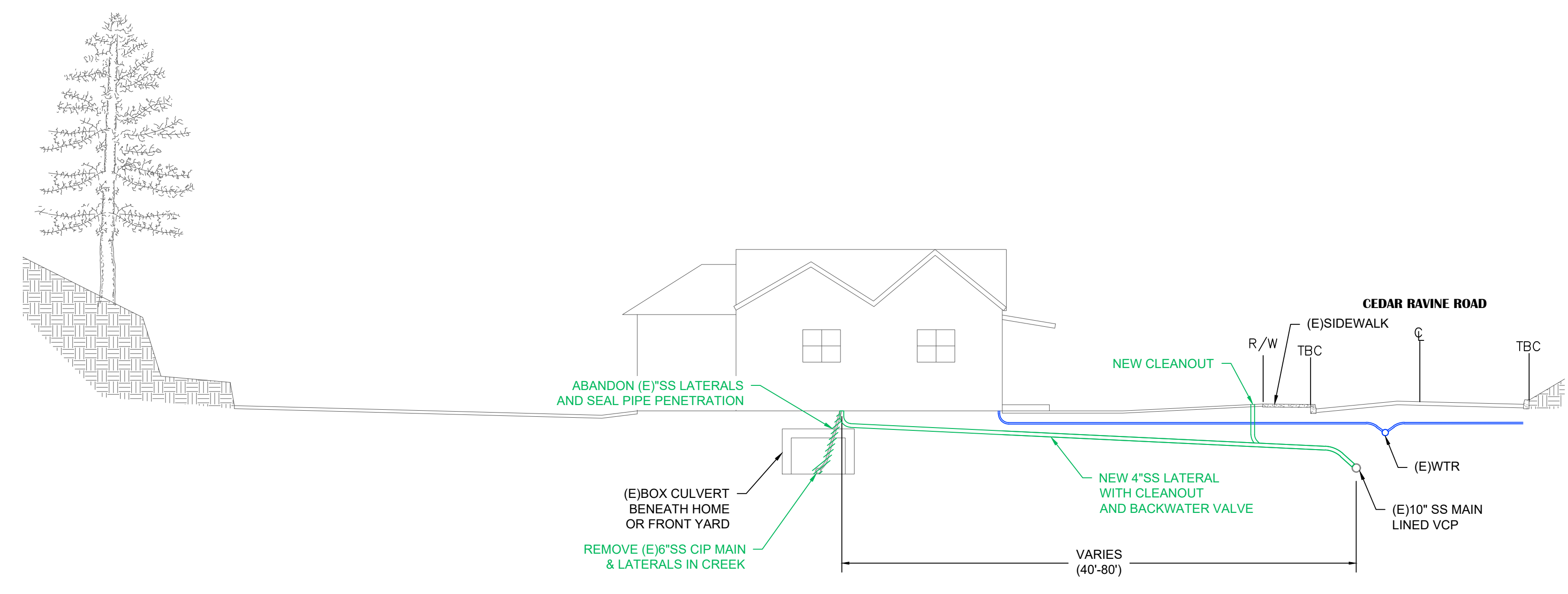
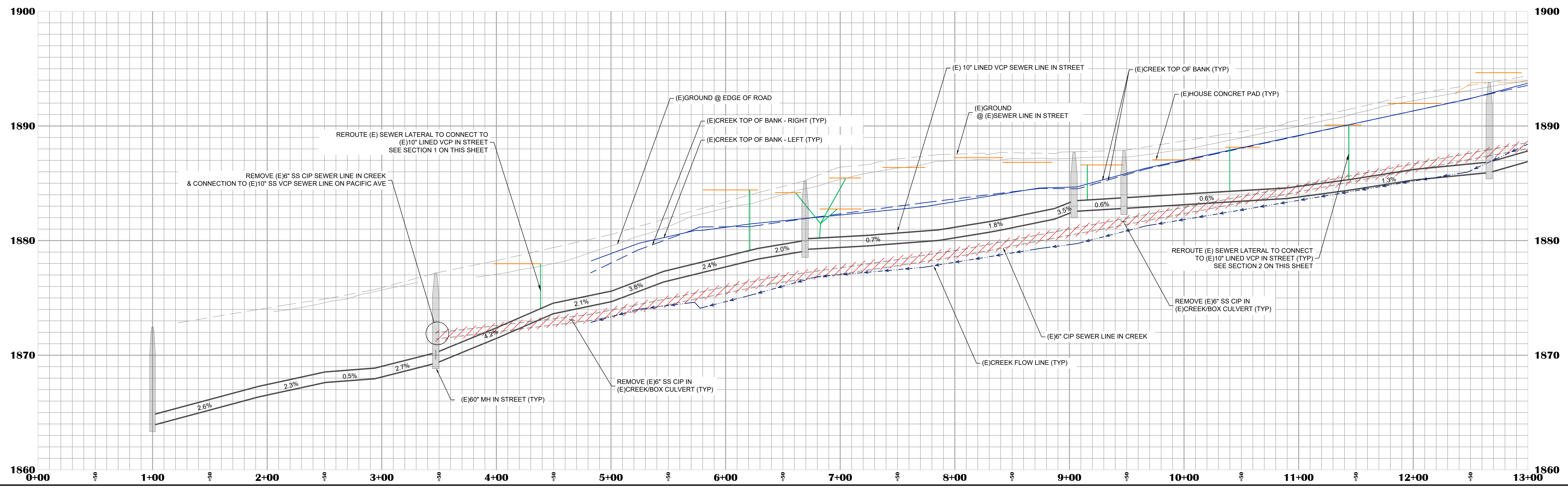
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	(E)SEWER IN CREEK OR FRONT YARDS
	(E)DRY UTILITY
	(E)WATER
	(E)STORM DRAIN
	(E)CREEK FLOWLINE & TOP OF BANK
	(E)HOUSE PAD

NOTES:  
 1. LOT ADDRESSES THAT INCLUDE AN ASTERISK AS A SUFFIX HAVE (E)SEWER LATERAL(S) THAT CONNECT TO THE (E)SEWER MAIN IN THE CREEK. REQUIRE REROUTING TO CONNECT TO THE (E)SEWER MAIN ON CEDAR RAVINE ROAD.

# CEDAR RAVINE ROAD



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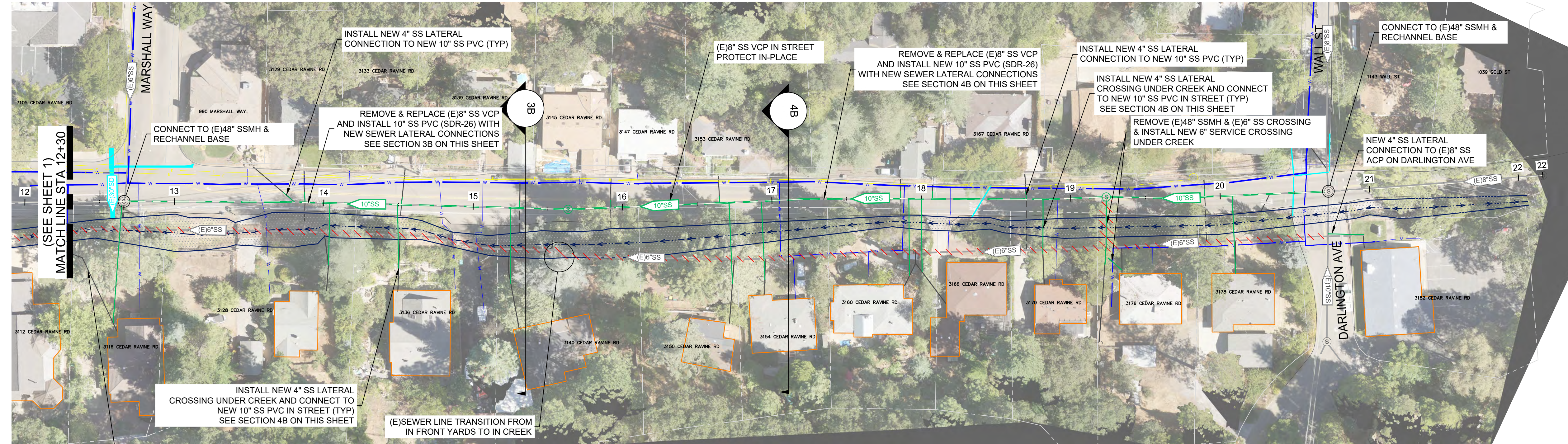


**2 SEWER IN CREEK UNDERNEATH HOMES OR UNDER FRONT YARD (STA 9+00 TO 12+30)**  
 Scale: 1" = 10'

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NO. REVISION	DESCRIPTION	CHECKED BY	DATE
PRELIMINARY			
DRAWING SCALE HOR. SCALE: 1"=40' VERT. SCALE: 1"=4'			
<b>REY ENGINEERS, INC.</b> Civil Engineers   Land Surveyors   LDAR 625 S. Main Street, Suite 200   Placerville, CA 95250 Phone: (916) 336-3340   Fax: (916) 336-3300			
EXHIBIT FOR: CEDAR RAVINE SEWER REPLACEMENT PROJECT SECTIONS 1 & 2 - STA 1+00 TO 12+30 PLAN & PROFILE CITY OF PLACERVILLE CA			
DRAWING INFO			
DATE: 8/25/20			
DRAFTER: AR/03			
DESIGNER: AR/03			
REVIEWER: AR/03			
PROJECT NO. 6884.013			
SHEET NO. 1 OF 3			



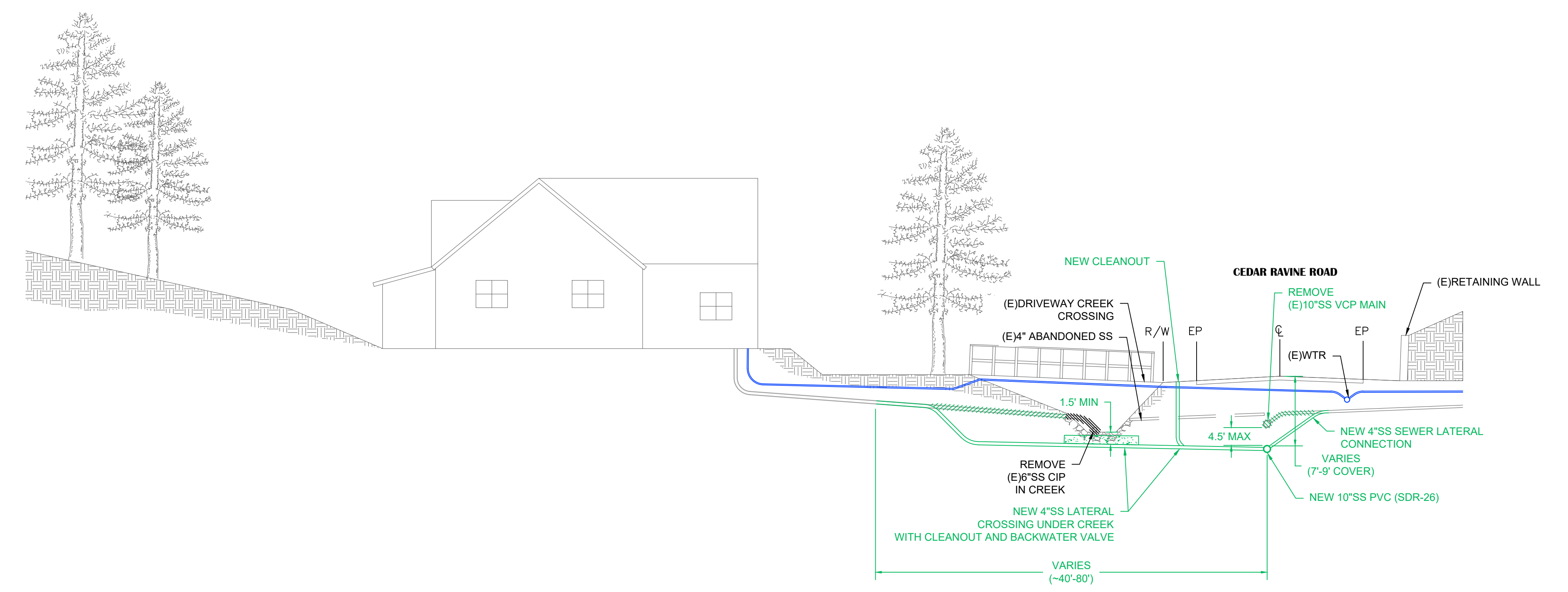
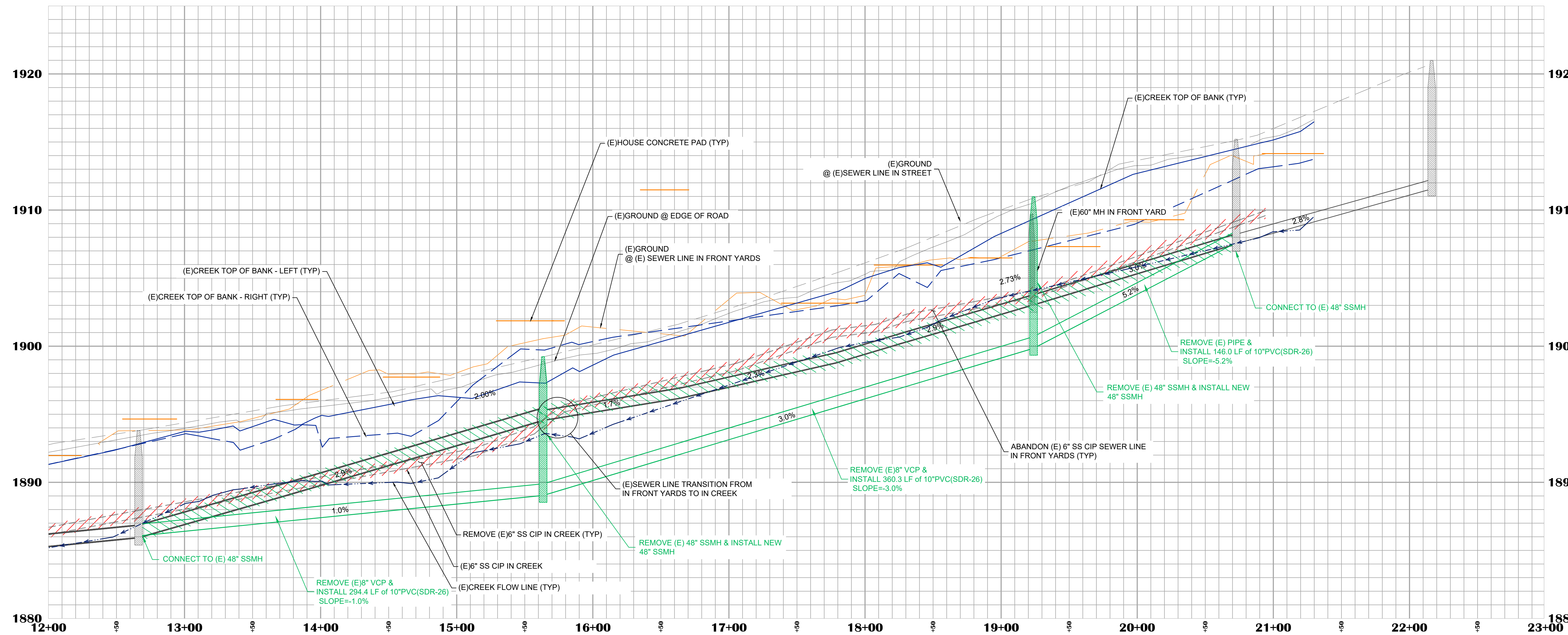


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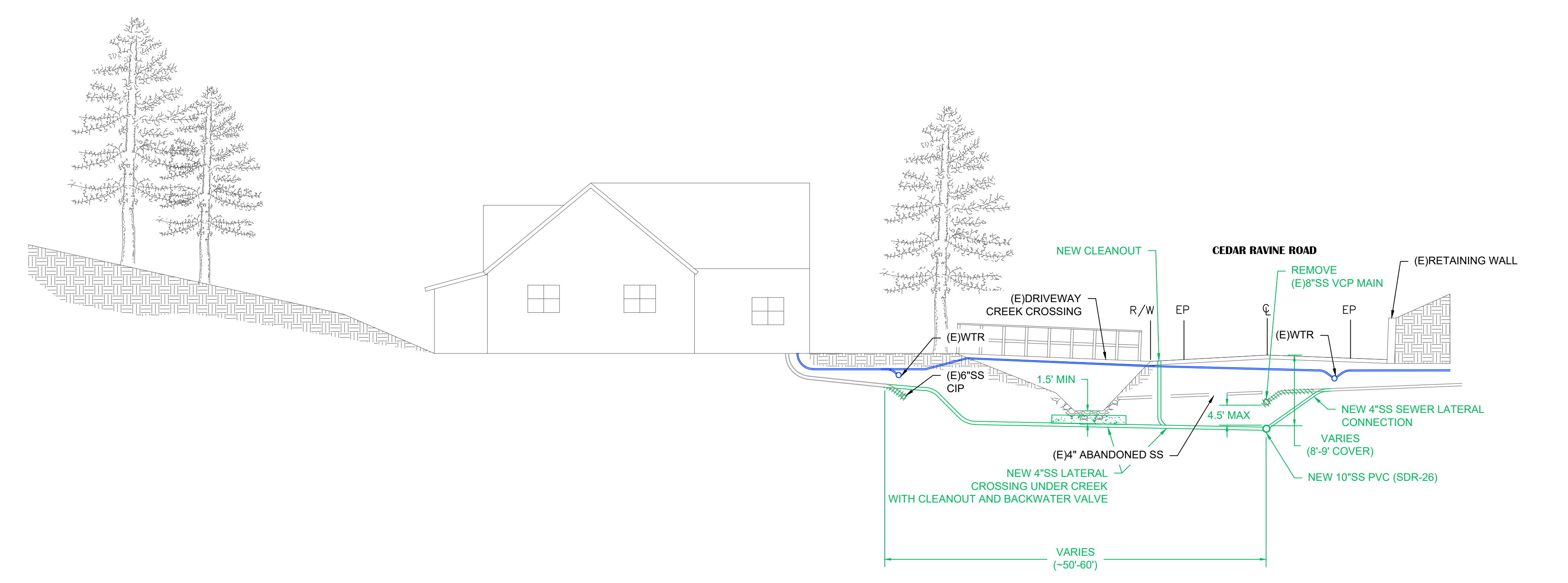
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	(E)WATER
	(E)STORM DRAIN
	(E)CREEK FLOWLINE & TOP OF BANK
	(E)HOUSE PAD

0 20' 40' 80'  
SCALE IN FEET

## CEDAR RAVINE ROAD



**3B SEWER IN CREEK IN FRONT YARD (STA 12+30 TO 15+50)**  
Scale: 1" = 10'



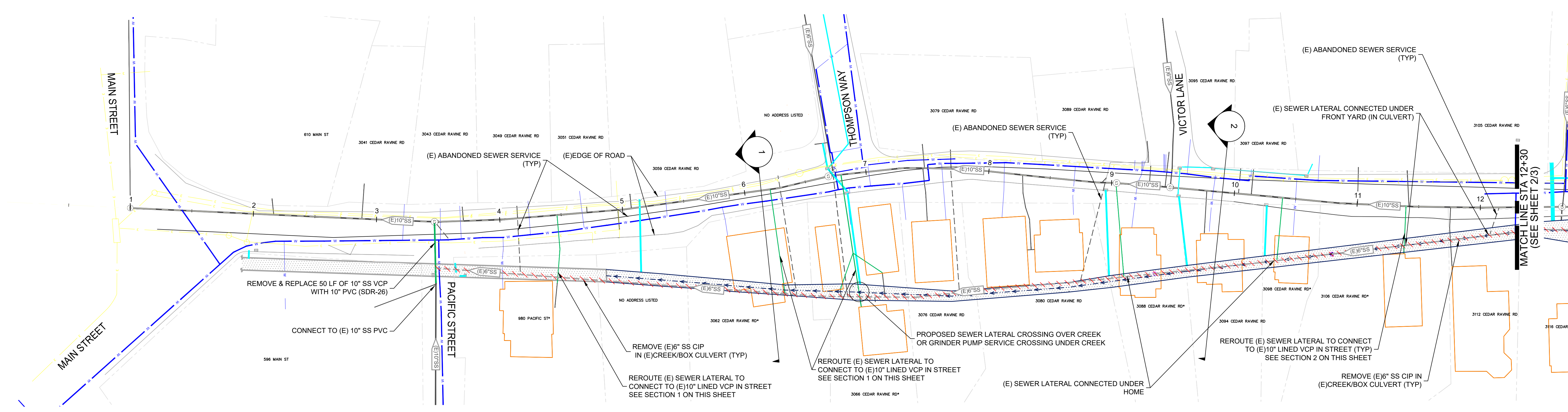
**4B SEWER IN FRONT YARD (STA 15+50 TO 21+00)**  
Scale: 1" = 10'

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DRAWING SCALE			
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<b>REY ENGINEERS, INC.</b> Civil Engineers   Land Surveys   DMR 425 S. State Street, Suite 200   Placerville, CA 95250 Phone: (916) 236-3347   Fax: (916) 236-3300			
<b>EXHIBIT FOR:</b> <b>CEDAR RAVINE SEWER REPLACEMENT PROJECT</b> <b>SECTIONS 3B &amp; 4B - STA 12+30 TO 21+00</b> <b>ALTERNATIVE B - PLAN &amp; PROFILE</b> <b>CITY OF PLACERVILLE CA</b>			
DRAWING INFO			
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DRAFTER:	AK	REVIEWER:	AK
PROJECT NO.	6884.013	SHEET NO. 3 OF 3	

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Attachment A-2

Scoping Exhibit without Orthographic Image

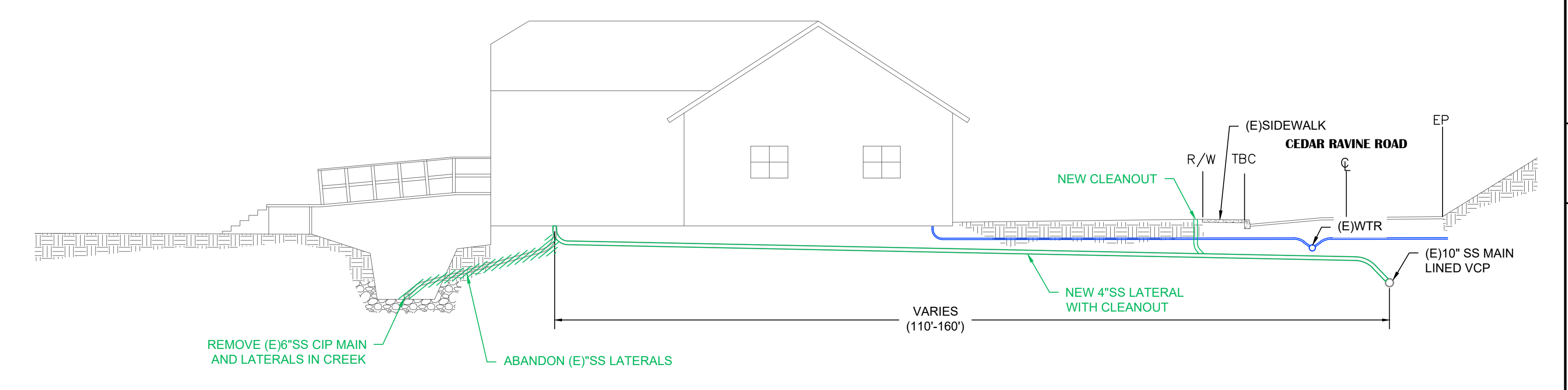


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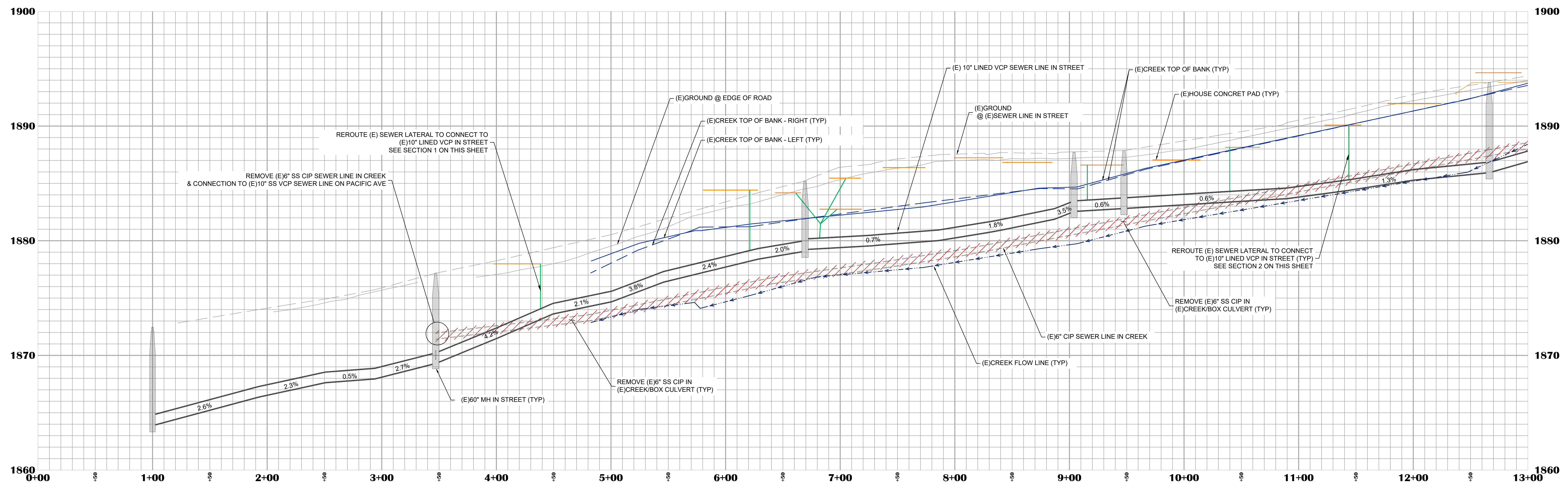
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	(E)DRY UTILITY
	(E)WATER
	(E)STORM DRAIN
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	(E)HOUSE PAD

NOTES:  
 1. LOT ADDRESSES THAT INCLUDE AN ASTERISK AS A SUFFIX HAVE (E)SEWER LATERAL(S) THAT CONNECT TO THE (E)SEWER MAIN IN THE CREEK. REQUIRE REROUTING TO CONNECT TO THE (E)SEWER MAIN ON CEDAR RAVINE ROAD.

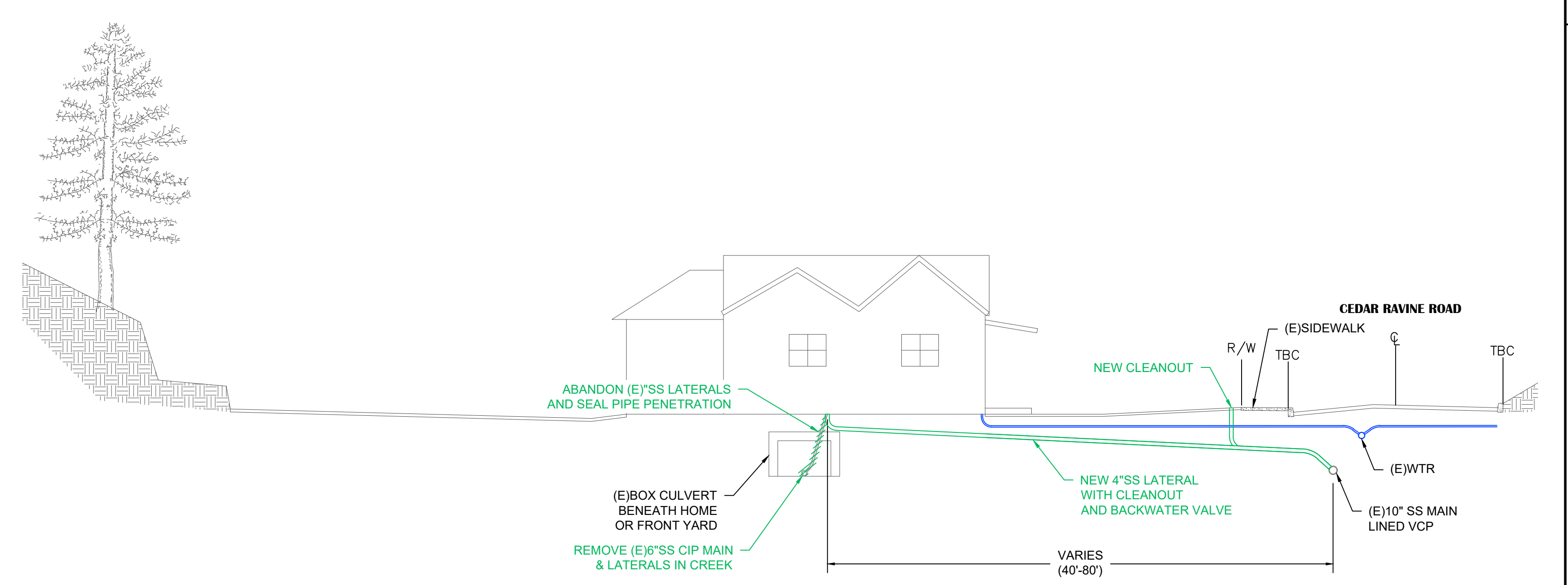
# CEDAR RAVINE ROAD



**1 SEWER IN CREEK BEHIND HOMES (STA 5+00 TO 9+00)**  
 Scale: 1" = 10'



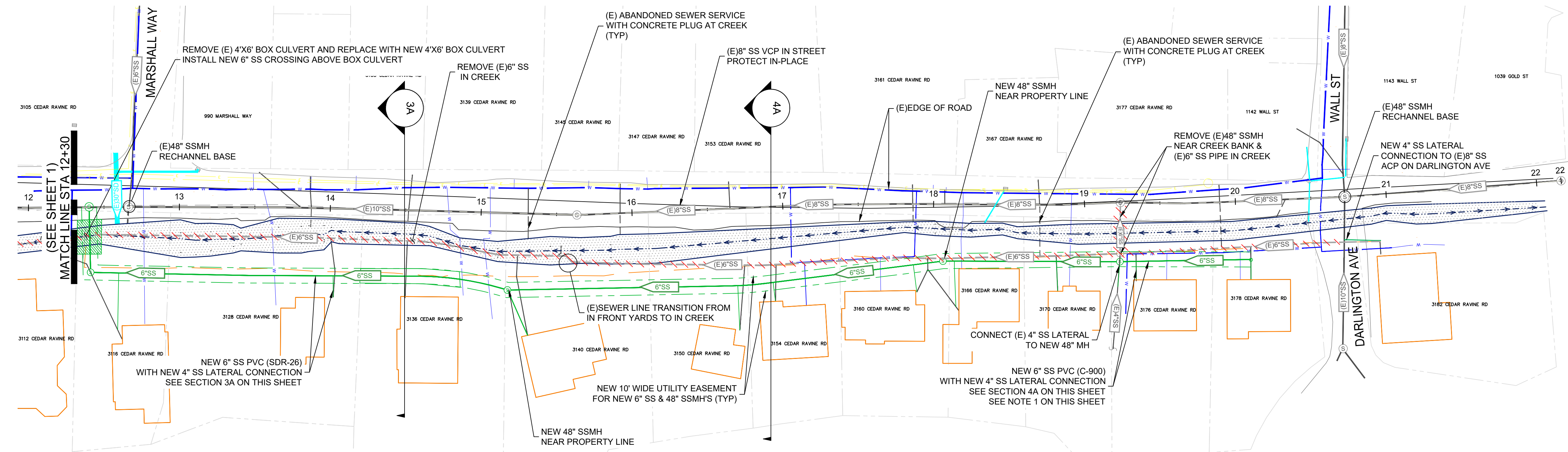
**2 SEWER IN CREEK UNDERNEATH HOMES OR UNDER FRONT YARD (STA 9+00 TO 12+30)**  
 Scale: 1" = 10'



**2 SEWER IN CREEK UNDERNEATH HOMES OR UNDER FRONT YARD (STA 9+00 TO 12+30)**  
 Scale: 1" = 10'

CHECKED BY:	DATE:
DESCRIPTION:	PRELIMINARY
DRAWING SCALE HOR. SCALE: 1"=40' VERT. SCALE: 1"=4'	
<b>REYL ENGINEERS, INC.</b> Civil Engineers   Land Surveyors   DNR 625 S. State Street, Suite 200   Placerville, CA 95250 Phone: (916) 336-3300   Fax: (916) 336-3300	
<b>EXHIBIT FOR:</b> <b>CEDAR RAVINE SEWER REPLACEMENT PROJECT</b> <b>SECTIONS 1 &amp; 2 - STA 1+00 TO 12+30</b> <b>PLAN &amp; PROFILE</b> <b>CITY OF PLACERVILLE CA</b>	
<b>DRAWING INFO</b> DATE: 8/25/2020 DRAFTER: RAB DESIGNER: RAB REVIEWER: RAB	
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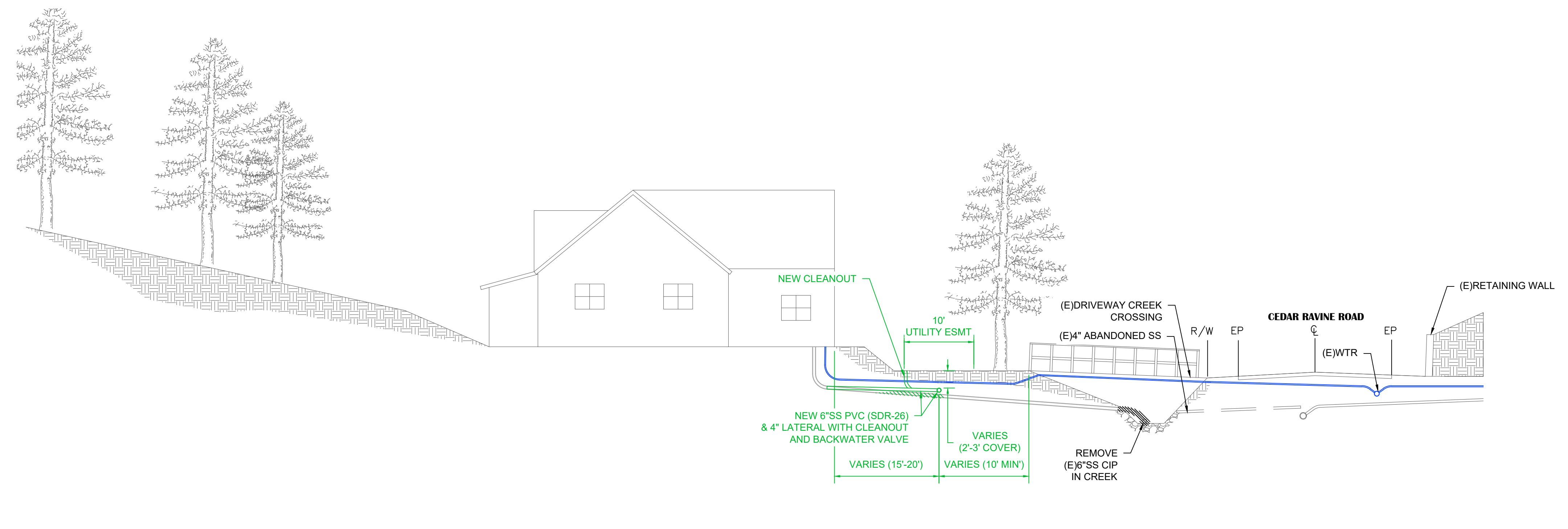
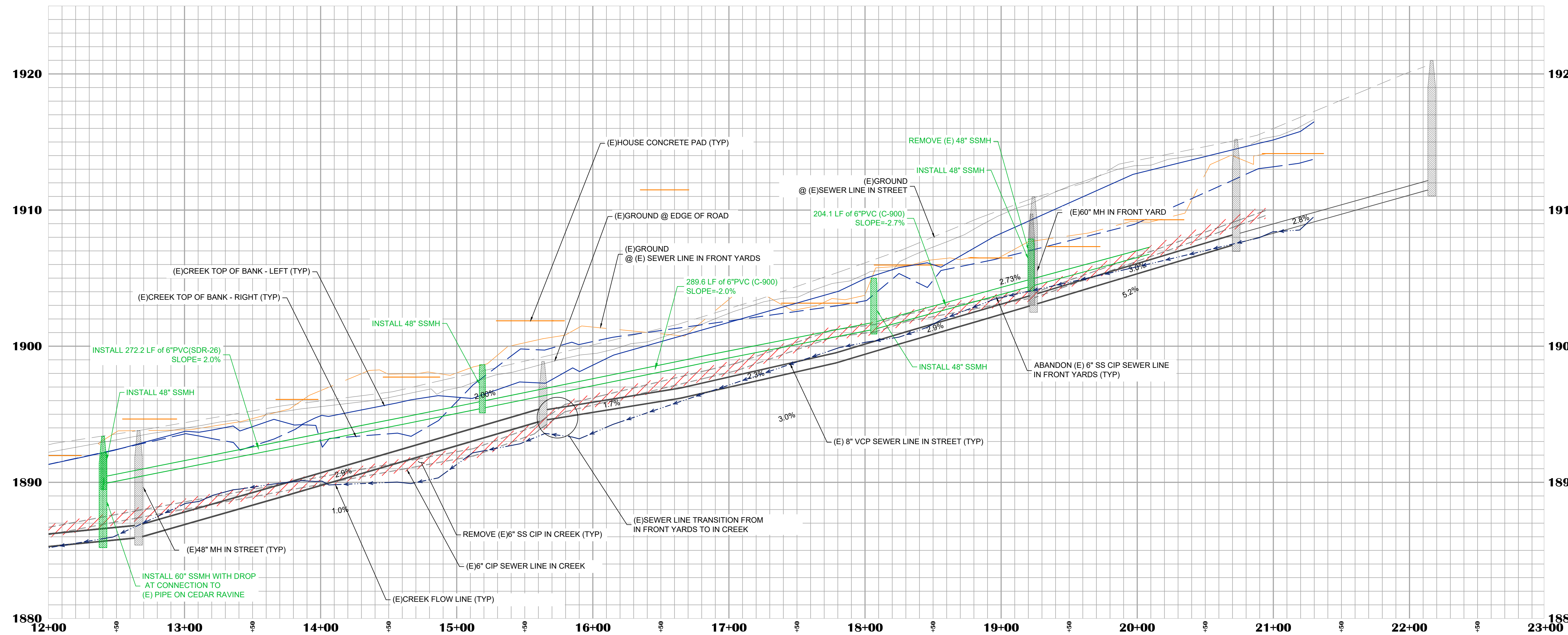


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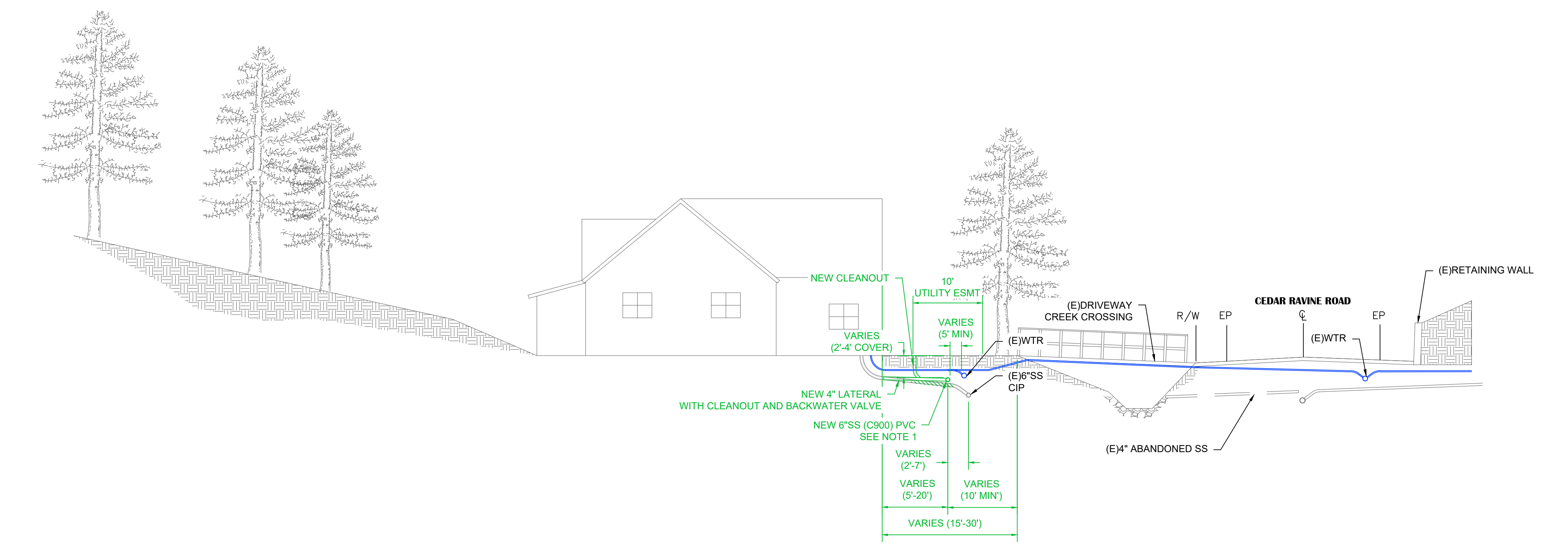
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	(E)SEWER IN ROAD
	(E)SEWER IN CREEK OR FRONT YARDS
	(E)DRY UTILITY
	(E)WATER
	(E)STORM DRAIN
	(E)CREEK FLOWLINE & TOP OF BANK
	(E)HOUSE PAD

NOTES:  
1. C900 PVC PIPE MATERIAL IS REQUIRED WHERE THE PROPOSED SEWER MAIN HAS LESS THAN 10' SEPARATION FROM THE (E) WATER FACILITIES

## CEDAR RAVINE ROAD



**3A SEWER IN CREEK IN FRONT YARD (STA 12+30 TO 15+50)**  
Scale: 1" = 10'



**4A SEWER IN FRONT YARD (STA 15+50 TO 21+00)**  
Scale: 1" = 10'

NO. REVISION	DESCRIPTION	CHECKED BY	DATE

PRELIMINARY

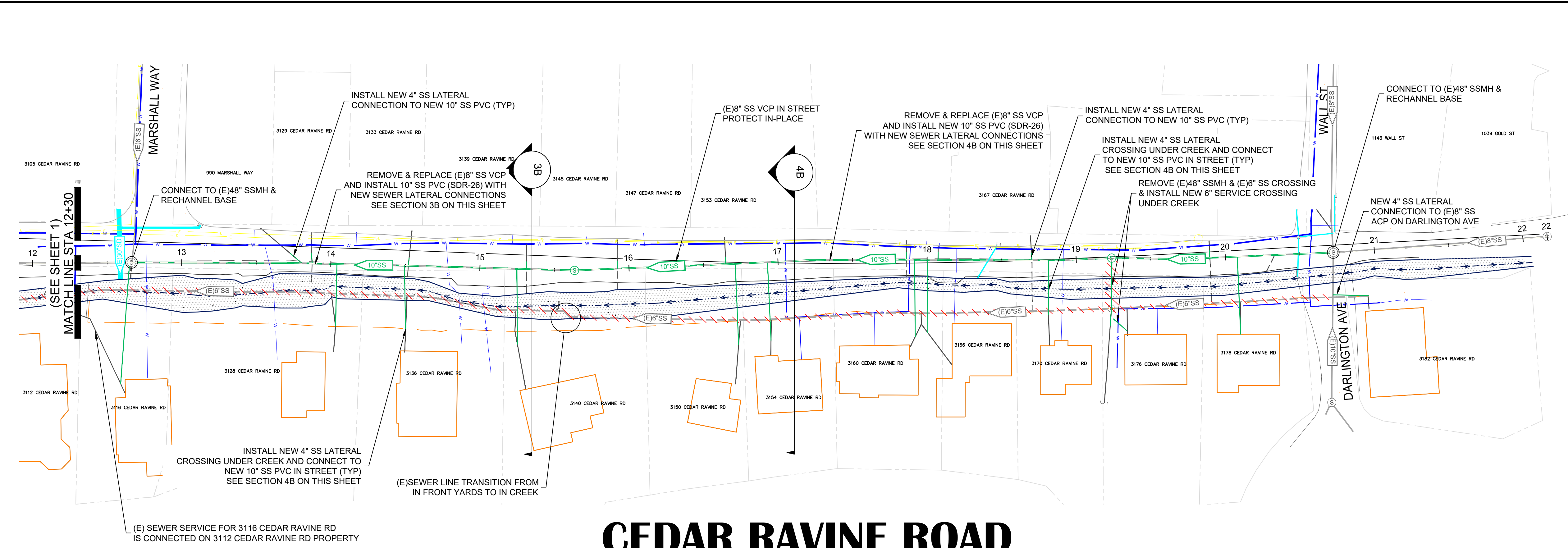
DRAWING SCALE  
HOR. SCALE: 1"=40'  
VERT. SCALE: 1"=4'

**REY ENGINEERS, INC.**  
Civil Engineers | Land Surveyors | LDRS  
425 S. Main Street, Suite 200 | Placerville, CA 95250  
Phone: 916.336.3367 | Fax: 916.336.3300

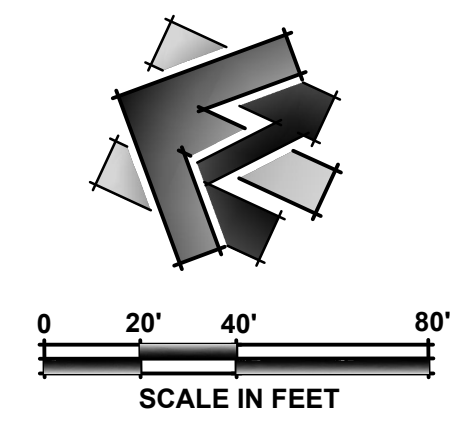
**EXHIBIT FOR:**  
**CEDAR RAVINE SEWER REPLACEMENT PROJECT**  
**SECTIONS 3A & 4A - STA 12+30 TO 21+00**  
**ALTERNATIVE A - PLAN & PROFILE**  
**CITY OF PLACERVILLE CA**

DRAWING INFO  
DATE: 08/20/20  
DRAFTER: RJS  
DESIGNER: RJS  
REVIEWER: RJS

PROJECT NO.  
**6884.013**  
SHEET NO. **2** OF **3**

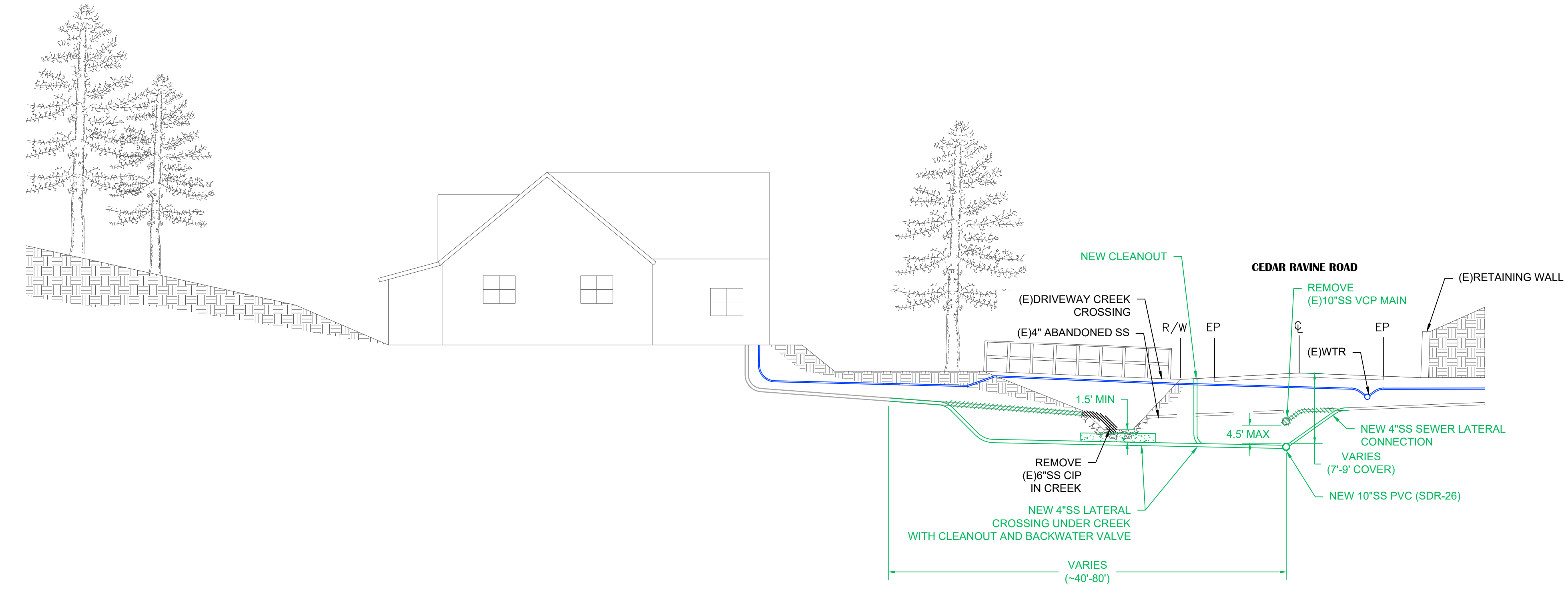


# CEDAR RAVINE ROAD

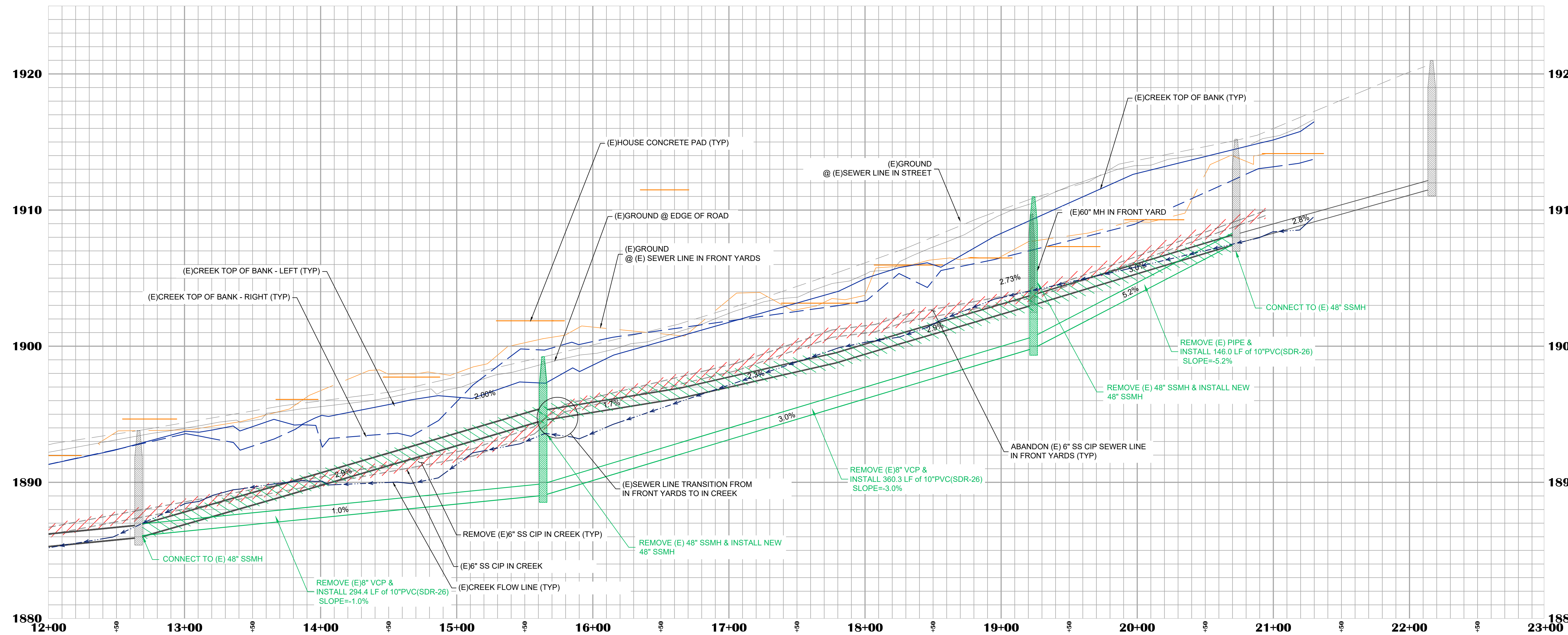


## LEGEND

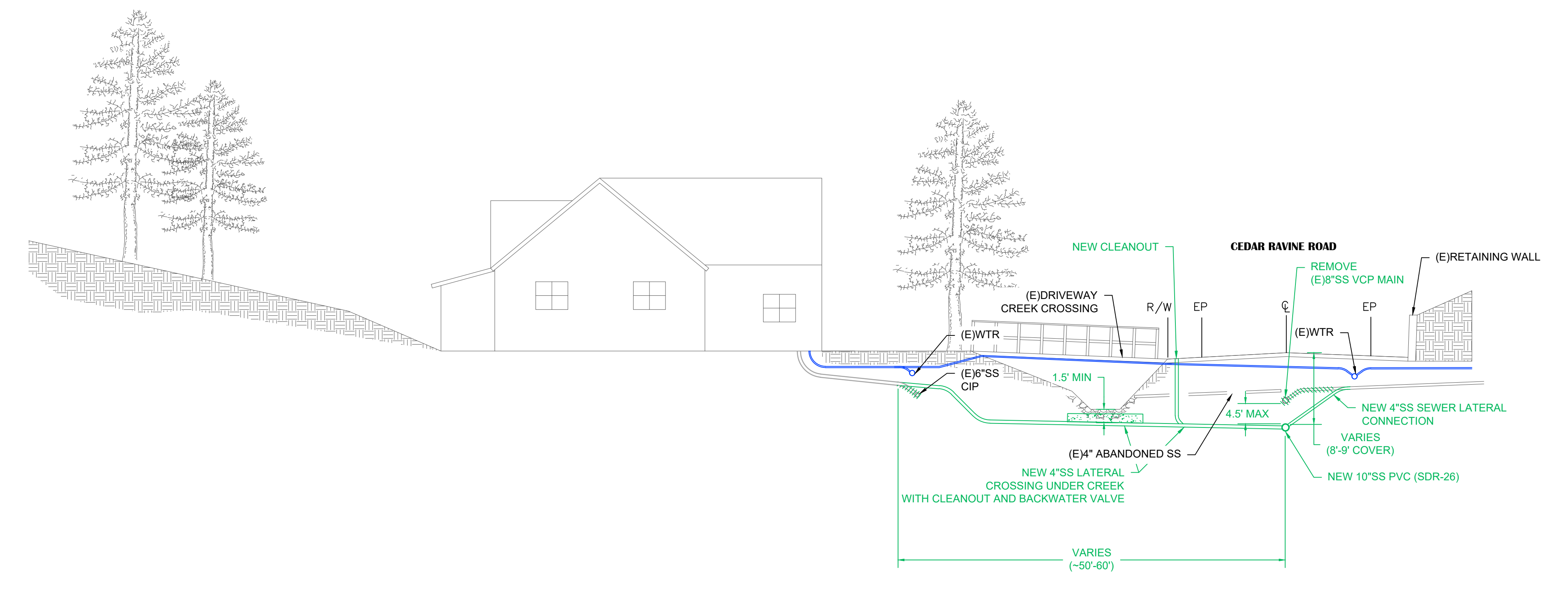
EXISTING	DESCRIPTION
	PROPOSED SEWER
	REMOVE (E)SEWER
	(E)SEWER IN ROAD
	(E)SEWER IN CREEK OR FRONT YARDS
	(E)DRY UTILITY
	(E)WATER
	(E)STORM DRAIN
	(E)CREEK FLOWLINE & TOP OF BANK
	(E)HOUSE PAD



**3B SEWER IN CREEK IN FRONT YARD (STA 12+30 TO 15+50)**  
Scale: 1" = 10'



**4B SEWER IN FRONT YARD (STA 15+50 TO 21+00)**  
Scale: 1" = 10'



NO. REVISION	DESCRIPTION	CHECKED BY	DATE
PRELIMINARY			
DRAWING SCALE			
HOR. SCALE: 1"=40'			
VERT. SCALE: 1"=4'			
<b>REY ENGINEERS, INC.</b> Civil Engineers   Land Surveyors   DWR 425 S. State Street, Suite 200   Placerville, CA 95220 Phone: (916) 236-3300   Fax: (916) 236-3300			
<b>EXHIBIT FOR:</b> <b>CEDAR RAVINE SEWER REPLACEMENT PROJECT</b> <b>SECTIONS 3B &amp; 4B - STA 12+30 TO 21+00</b> <b>ALTERNATIVE B - PLAN &amp; PROFILE</b> <b>CITY OF PLACERVILLE CA</b>			
DRAWING INFO			
DATE:	8/25/2020	DESIGNER:	AK
DRAFTER:	AK	REVIEWER:	AK
PROJECT NO.	6884.013	SHEET NO. 3 OF 3	

**Attachment B - Engineer's Estimates of Probable Cost**

## Engineer's Estimate of Probable Cost

Project: City of Placerville - Cedar Ravine Sewer Improvements  
 Estimate #: 1  
 Section: Sections 1 & 2 - STA 1+00 to 12+30  
 Alternative: Re-route Sewer Laterals to Existing Sewer Main on Cedar Ravine Road  
 Source: Based on Conceptual Design shown on Scoping Exhibit - Sheet 3  
 Date: 9/22/2020  
 Prepared by: RJR  
 Reviewed by: RJH

**R.E.Y. ENGINEERS, INC.**  
 Civil Engineers | Land Surveyors | LiDAR  
 905 Sutter Street, Suite 200 Folsom, CA 95630  
 Phone: (916) 366-3040 Fax: (916) 366-3303  
 www.reyengineers.com



### GENERAL/OVERHEAD RELATED ITEMS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1.01	Mobilization	1	LS	\$ 30,000.00	\$ 30,000
1.02	Construction Area Signs	1	LS	\$ 10,000.00	\$ 10,000
1.03	Traffic Control	1	LS	\$ 50,000.00	\$ 50,000
1.04	Water Pollution Control Plan	1	LS	\$ 5,000.00	\$ 5,000
1.05	Erosion Control	1	LS	\$ 10,000.00	\$ 10,000
<b>GENERAL SUBTOTAL</b>					<b>\$ 105,000</b>

### SEWER

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
2.01	Remove Existing 6" Sewer in Creek & Under Homes	900	LF	\$ 50.00	\$ 45,000
2.02	Remove & Replace Existing Sewer Main with 10" PVC(SDR 26)	50	LF	\$ 400.00	\$ 20,000
2.03	4" Lateral Sewer Service with Cleanout & Backwater Valves	8	EA	\$ 10,000.00	\$ 80,000
2.04	TV Camera Inspection	1	LS	\$ 1,000.00	\$ 1,000
2.05	Connect to Existing Sewer System	1	EA	\$ 15,000.00	\$ 15,000
2.06	Bypass Pumping	1	LS	\$ 20,000.00	\$ 20,000
<b>SEWER SUBTOTAL</b>					<b>\$ 181,000</b>

### MISCELLANEOUS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
3.01	Pavement Restoration	1,000	SF	\$ 10.00	\$ 10,000
3.02	Sidewalk Restoration	200	SF	\$ 30.00	\$ 6,000
3.03	Pothole Existing Utilities	12	EA	\$ 2,000.00	\$ 24,000
3.04	Dewatering	1	LS	\$ 10,000.00	\$ 10,000
<b>MISCELLANEOUS SUBTOTAL</b>					<b>\$ 50,000</b>

### SUMMARY OF COSTS

<b>GENERAL/OVERHEAD RELATED ITEMS</b>	<b>\$ 105,000</b>
<b>SEWER</b>	<b>\$ 181,000</b>
<b>MISCELLANEOUS</b>	<b>\$ 50,000</b>

CONSTRUCTION COSTS	\$	336,000
CONTINGENCY	30%	\$ 100,800
<b>HARD COST SUBTOTAL</b>	<b>\$</b>	<b>436,800</b>
DESIGN <sup>1</sup>	10%	43,680
CONSTRUCTION MANAGEMENT	20%	\$ 87,360
ADMINISTRATION & PUBLIC OUTREACH <sup>2</sup>	25%	\$ 109,200
<b>SOFT COST SUBTOTAL</b>	<b>\$</b>	<b>240,240</b>
<b>TOTAL EST. PROJECT COST (HARD + SOFT)</b>	<b>\$</b>	<b>677,040</b>

**Notes:**

1. Includes 100% PS&E. Excludes the cost of environmental permitting services and fees.
2. Includes staff time to coordinate with Owner's and work required on private property.

*In providing construction cost estimates, the Client understands that the Consultant has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the Consultant's construction cost estimates are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's cost estimate.*

## Engineer's Estimate of Probable Cost

Project: City of Placerville - Cedar Ravine Sewer Improvements  
 Estimate #: 2 - Alternative A  
 Section: Sections 3 & 4 - STA 12+30 to 21+00  
 Alternative: Alternative A - Install New 6" Sewer Collector in Front Yards  
 Source: Based on Conceptual Design shown on Scoping Exhibit - Sheet 2  
 Date: 9/22/2020  
 Prepared by: RJR  
 Reviewed by: RJH



### GENERAL/OVERHEAD RELATED ITEMS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1.01	Mobilization	1	LS	\$ 100,000.00	\$ 100,000
1.02	Construction Area Signs	1	LS	\$ 10,000.00	\$ 10,000
1.03	Traffic Control	1	LS	\$ 20,000.00	\$ 20,000
1.04	Water Pollution Control Plan	1	LS	\$ 10,000.00	\$ 10,000
1.05	Erosion Control	1	LS	\$ 20,000.00	\$ 20,000
<b>GENERAL SUBTOTAL</b>					<b>\$ 160,000</b>

### SEWER

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
2.01	Remove Existing 48" Manhole	1	EA	\$ 8,000.00	\$ 8,000
2.02	Abandon Existing Sewer Services in Creek & Front Yards	12	EA	\$ 3,000.00	\$ 36,000
2.03	Remove Existing 6" Sewer in Creek	400	LF	\$ 50.00	\$ 20,000
2.04	Abandon Existing 6" Sewer in Front Yards	500	LF	\$ 20.00	\$ 10,000
2.05	6" PVC(SDR 26) Sewer in Front Yard	270	LF	\$ 200.00	\$ 54,000
2.06	6" PVC(C-900) Sewer in Front Yard	500	LF	\$ 220.00	\$ 110,000
2.07	48" Manhole in Front Yard	5	EA	\$ 18,000.00	\$ 90,000
2.08	Rechannel Existing 48" Manhole	2	EA	\$ 3,000.00	\$ 6,000
2.09	4" Lateral Sewer Service with Cleanout & Bypass Valve	12	EA	\$ 6,000.00	\$ 72,000
2.10	TV Camera Inspection	1	LS	\$ 1,000.00	\$ 1,000
2.11	Connect to Existing Sewer System	1	EA	\$ 10,000.00	\$ 10,000
2.12	Bypass Pumping	1	LS	\$ 10,000.00	\$ 10,000
<b>SEWER SUBTOTAL</b>					<b>\$ 427,000</b>

### MISCELLANEOUS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
3.01	Pavement Restoration	600	SF	\$ 10.00	\$ 6,000
3.02	Concrete/Hardscape Restoration in Front Yards	3,100	SF	\$ 30.00	\$ 93,000
3.03	Relocate Water Service at Sewer Lateral Crossing	12	EA	\$ 2,000.00	\$ 24,000
3.04	Pothole Existing Utilities	19	EA	\$ 2,000.00	\$ 38,000
3.05	Temporary Creek Diversion/Bypass	1	LS	\$ 10,000.00	\$ 10,000
3.06	Tree Removal	1	LS	\$ 20,000.00	\$ 20,000
3.07	Sewer Crossing Creek with Remove & Replace Existing 4'x6' Box Culvert	1	LS	\$ 150,000.00	\$ 150,000
3.08	Dewatering	1	LS	\$ 50,000.00	\$ 50,000
3.09	Rock Excavation	1	LS	\$ 20,000.00	\$ 20,000
<b>MISCELLANEOUS SUBTOTAL</b>					<b>\$ 411,000</b>

### SUMMARY OF COSTS

<b>GENERAL/OVERHEAD RELATED ITEMS</b>	<b>\$ 160,000</b>
<b>SEWER</b>	<b>\$ 427,000</b>
<b>MISCELLANEOUS</b>	<b>\$ 411,000</b>

CONSTRUCTION COSTS	\$ 998,000
CONTINGENCY 30%	\$ 299,400
<b>HARD COST SUBTOTAL</b>	<b>\$ 1,297,400</b>
FRONT YARD EASEMENT MAPPING <sup>1</sup> 3%	\$ 38,922
DESIGN <sup>2</sup> 20%	\$ 259,480
CONSTRUCTION MANAGEMENT 20%	\$ 259,480
ADMINISTRATION 5%	\$ 64,870
<b>SOFT COST SUBTOTAL</b>	<b>\$ 622,752</b>
<b>TOTAL EST. PROJECT COST (HARD + SOFT)</b>	<b>\$ 1,920,152</b>

#### Notes:

1. Excludes costs associated with acquisition of easement in front yards. Includes services to provide mapping to record new utility easement in front yard.
2. Includes 100% PS&E. Excludes the cost of environmental permitting services and fees.

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## Engineer's Estimate of Probable Cost

Project: City of Placerville - Cedar Ravine Sewer Improvements  
 Estimate #: 3 - Alternative B  
 Section: Sections 3 & 4 - STA 12+30 to 21+00  
 Alternative: Alternative B - Remove & Replace Sewer Main on Cedar Ravine  
 Source: Based on Conceptual Design shown on Scoping Exhibit - Sheet 3  
 Date: 9/22/2020  
 Prepared by: RJR  
 Reviewed by RJH

**RE.Y. ENGINEERS, INC.**  
 Civil Engineers | Land Surveyors | LIDAR  
 905 Sutter Street, Suite 200 Folsom, CA 95630  
 Phone: (916) 366-3040 Fax: (916) 366-3303  
 www.reyengineers.com



### GENERAL/OVERHEAD RELATED ITEMS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1.01	Mobilization	1	LS	\$ 400,000.00	\$ 400,000
1.02	Construction Area Signs	1	LS	\$ 20,000.00	\$ 20,000
1.03	Traffic Control	1	LS	\$ 200,000.00	\$ 200,000
1.04	Water Pollution Control Plan	1	LS	\$ 10,000.00	\$ 10,000
1.05	Erosion Control	1	LS	\$ 50,000.00	\$ 50,000
<b>GENERAL SUBTOTAL</b>					<b>\$ 680,000</b>

### SEWER

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
2.01	Remove Existing 48" Manhole	3	EA	\$ 8,000.00	\$ 24,000
2.02	Abandon Existing Sewer Services	22	EA	\$ 3,000.00	\$ 66,000
2.03	Remove Existing 6" Sewer in Creek	400	LF	\$ 50.00	\$ 8,000
2.04	Abandon Existing 6" Sewer in Front Yards	500	LF	\$ 4.00	\$ 2,000
2.05	Remove & Replace Existing Sewer Main with 10" PVC(SDR 26)	810	LF	\$ 350.00	\$ 283,500
2.06	48" Manhole	2	EA	\$ 15,000.00	\$ 30,000
2.07	Rechannel Existing 48" Manhole	2	EA	\$ 3,000.00	\$ 6,000
2.08	4" Lateral Sewer Service with Cleanout (Includes Creek Crossing)	12	EA	\$ 40,000.00	\$ 480,000
2.09	4" Lateral Sewer Service with Cleanout (Excludes Creek Crossing)	10	EA	\$ 6,000.00	\$ 60,000
2.10	TV Camera Inspection	1	LS	\$ 2,500.00	\$ 2,500
2.11	Connect to Existing Sewer System	2	EA	\$ 10,000.00	\$ 20,000
2.12	Bypass Pumping	1	LS	\$ 90,000.00	\$ 90,000
<b>SEWER SUBTOTAL</b>					<b>\$ 1,072,000</b>

### MISCELLANEOUS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
3.01	Pavement Restoration	6,800	SF	\$ 10.00	\$ 68,000
3.02	Pothole Existing Utilities	29	EA	\$ 2,000.00	\$ 58,000
3.03	Temporary Creek Diversion/Bypass	1	LS	\$ 50,000.00	\$ 50,000
3.04	Dewatering	1	LS	\$ 50,000.00	\$ 50,000
3.05	Removal of Structures/Obstructions	1	LS	\$ 50,000.00	\$ 50,000
3.06	Tree Removal	1	LS	\$ 50,000.00	\$ 50,000
3.07	Rock Excavation	1	LS	\$ 100,000.00	\$ 100,000
<b>MISCELLANEOUS SUBTOTAL</b>					<b>\$ 426,000</b>

### SUMMARY OF COSTS

<b>GENERAL/OVERHEAD RELATED ITEMS</b>	<b>\$ 680,000</b>
<b>SEWER</b>	<b>\$ 1,072,000</b>
<b>MISCELLANEOUS</b>	<b>\$ 426,000</b>

CONSTRUCTION COSTS	\$ 2,178,000
CONTINGENCY 30%	\$ 653,400
<b>HARD COST SUBTOTAL</b>	<b>\$ 2,831,400</b>
DESIGN <sup>1</sup> 20%	\$ 566,280
CONSTRUCTION MANAGEMENT 20%	\$ 566,280
ADMINISTRATION 5%	\$ 141,570
<b>SOFT COST SUBTOTAL</b>	<b>\$ 1,274,130</b>
<b>TOTAL EST. PROJECT COST (HARD + SOFT)</b>	<b>\$ 4,105,530</b>

Notes:

1. Includes 100% PS&E. Excludes the cost of environmental permitting services and fees.

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# CITY OF PLACERVILLE

## Summary of Engineer's Estimates of Probable Cost

Project: City of Placerville - Cedar Ravine Sewer Improvements  
 Source: Based on Conceptual Design shown on Scoping Exhibit  
 Job number: P2016.056  
 Date: 9/22/2020  
 Prepared by: RJR  
 Reviewed by: RJH



SECTION:	SECTION 1 & 2	SECTION 3 & 4		ENTIRE PROJECT - SECTIONS 1 TO 4	
IMPROVEMENT:	RE-ROUTE SEWER LATERALS	ALTERNATIVE A - FRONT YARD SEWER	ALTERNATIVE B - SEWER CROSSINGS	TOTAL WITH ALTERNATIVE A	TOTAL WITH ALTERNATIVE B
Hard Cost (with 30% Contingency)	\$ 436,800	\$ 1,297,400	\$ 2,831,400	\$ 1,734,200	\$ 3,268,200
Soft Costs (Design, CM, Easements, & Admin)	\$ 240,240	\$ 622,752	\$ 1,274,130	\$ 862,992	\$ 1,514,370
Total Estimated Project Cost (2020)	\$ 677,040	\$ 1,920,152	\$ 4,105,530	\$ 2,597,192	\$ 4,782,570
Total Estimated Project Cost (2021)*	\$ 710,892	\$ 2,016,160	\$ 4,310,807	\$ 2,727,052	\$ 5,021,699
Total Estimated Project Cost (2022)*	\$ 746,437	\$ 2,116,968	\$ 4,526,347	\$ 2,863,404	\$ 5,272,783
Total Estimated Project Cost (2023)*	\$ 783,758	\$ 2,222,816	\$ 4,752,664	\$ 3,006,574	\$ 5,536,423

Notes: \*Assumes 5% annual increase in cost