



Project No. S2439-05-05
June 4, 2025

VIA ELECTRONIC MAIL

Carl Moore, PE, City Engineer
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Subject: SEEPAGE EVALUATION AND MITIGATION RECOMMENDATIONS
CULVER STREET
COLFAX, CALIFORNIA

Mr. Moore:

In accordance with your request, this letter summarizes our evaluation of seasonal seepage observed along a portion of Culver Street in Colfax, California. The approximate location of the site is shown on the Vicinity Map, Figure 1.

PROJECT DESCRIPTION AND PURPOSE

Culver Street, between Grass Valley Street and Church Street, was recently reconstructed in 2025 with a new hot mix asphalt (HMA) pavement section. Following winter rains, seepage was observed emanating from the HMA near the west shoulder of the road (right side in the photo below) and extending to the east and south.



The approximate extents of the seepage (as observed on March 4, 2025) are shown on the Site Plan, Figure 2.

The City would like to mitigate this condition to protect the integrity of the relatively new pavement section within Culver Street. The purpose of our geotechnical services was to evaluate subsurface conditions within the area of seepage and provide mitigation recommendations.

SCOPE OF SERVICES

Our evaluation included the following scope of services:

- Performing a limited geologic literature review to aid in evaluating the geologic conditions present at the site.
- Reviewing available design plans and other documentation for the recent pavement reconstruction project along Culver Street.
- Excavating seven (7) hand-auger borings (HA1 through HA7) along the west edge of the pavement by using a hand-auger to depths ranging from approximately 6 inches to 4 feet. Approximate hand-auger boring locations are shown on the Site Plan, Figure 2.
- Logging the subsurface conditions encountered in the borings in general accordance with the Unified Soil Classification System. Upon completion, we backfilled the borings with the excess soil cuttings.
- Preparing this summary letter report with our findings, conclusions, and recommendations.

FIELD OBSERVATIONS

Our field investigation was performed on March 4, 2025. At the site of our field visit, the weather was clear; however, precipitation had occurred within the prior 7 days. During our visit, we observed seepage emanating from the HMA pavement at the approximate location shown on Figure 2. In addition, we observed surface water in the unpaved roadside ditch on the west side of the road.

The site is located within the Sierra Nevada Geomorphic Province of California. The Sierra Nevada Geomorphic Province is a tilted fault block bounded by the Cascade Range to the east and the Great Valley to the west. The Sierra Nevada derives from glacial sculpting and weathering of Mesozoic granitic, sedimentary, volcanic, and ultramafic rocks. In the local site area, subsurface conditions generally consist of near-surface weathered bedrock with a thin soil cover.

To evaluate the subsurface conditions and the vertical extent of seepage within and adjacent to the ditch, we excavated seven hand-auger borings at the approximate locations shown on Figure 2. Pertinent details from the borings are summarized in Table 1.

**TABLE 1
SUMMARY OF EXPLORATORY BORINGS**

Boring ID	Depth to Seepage	Total Depth
HA1	14 inches	18 inches
HA2	3 inches	9 inches
HA3	17 inches	24 inches
HA4	None Encountered	51 inches
HA5	14 inches	20 inches
HA6	10 inches	16 inches
HA7	17 inches	24 inches

As shown in Table 1, we encountered seepage in 6 of the 7 borings at variable depths. Above the seepage, we encountered soil generally consisting of sandy lean clay with gravel. At or slightly below the seepage, we encountered variably weathered rock. In most areas, we were able to hand-auger 4 to 6 inches into the rock before encountering refusal. In Boring HA4, we were able to auger to a depth of approximately 51 inches.

CONCLUSIONS AND RECOMMENDATIONS

Based on our field observations and the conditions encountered in our borings, it appears that the seepage is the result of shallow subsurface upgradient water that is perched within the soil on the underlying weathered rock. This condition is common in this type of geology (shallow soil over variably weathered rock).

Per the improvement plans for the recent road reconstruction (GHD, 2023), the new pavement section for Culver Street consists of 0.25 feet (3 inches) of HMA over 0.8 feet (10 inches) of aggregate base (AB). However, we understand that the actual pavement section that was constructed may be thinner as the result of a value engineering change which incorporated geosynthetic reinforcement below the AB layer. The revised pavement section reportedly consists of 3 inches of HMA over 6 inches of AB over Tensor InterAx NX850 geogrid. With this configuration, the bottom of the AB layer (approximately 9 inches below the top of the street) is roughly coincident or close to the level of seepage observed in our borings. This suggests that the seepage, which is under some degree of head, is transmitting through the AB and HMA layers daylighting on the pavement surface, as observed.

Based on the conditions observed and the as-built conditions of Culver Street and the associated storm drainage facilities, we recommend installing a subdrain/edge drain along the western side of the road. The subdrain/edge drain should consist of a gravel-filled trench and including a perforated pipe. Figure 3 shows the recommended alignment and details of the drain.

Geocon should provide periodic site visits during construction to observe key portions of the mitigation to verify subsurface conditions and appropriateness of our design recommendations. If necessary, we will provide revised recommendations and direction in the field as conditions warrant.

The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, we should be notified so that supplemental recommendations can be given.

LIMITATIONS

This letter is issued with the understanding that it is the responsibility of the owner or their representative to ensure that the information and recommendations contained herein are brought to the attention of the design team for the project and incorporated into the plans and specifications and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.


The recommendations contained in this report are preliminary until verified during construction by representatives of our firm. Changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. Additionally, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated partially or wholly by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices used in the site area at this time. No warranty is provided, express or implied.

Please contact us if you have any questions regarding this letter or if we may be of further service.

Respectfully Submitted,

GEOCON CONSULTANTS, INC.

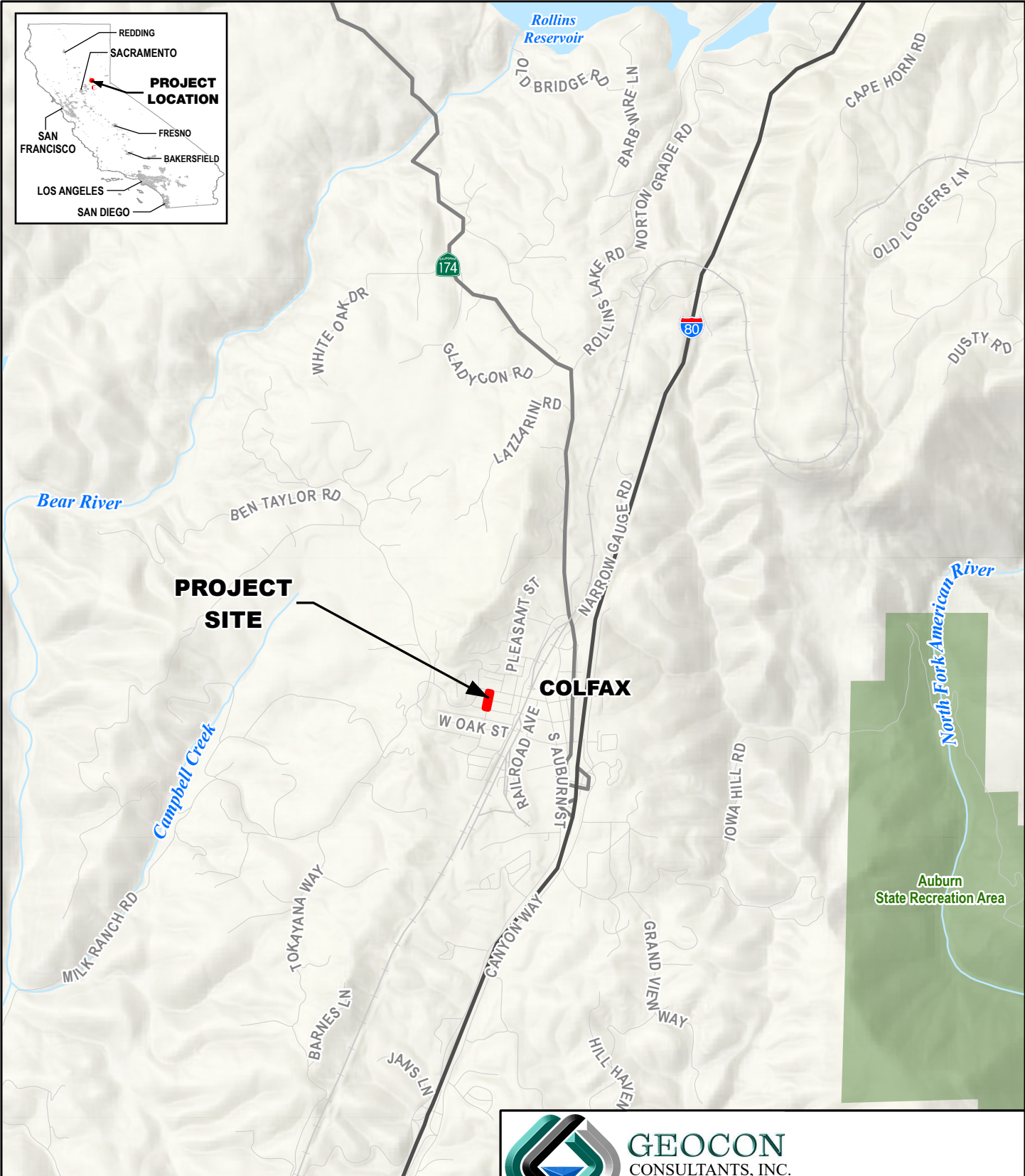


Jeremy Zorne, PE, GE
Senior Engineer



Tyler Henderson, GIT
Senior Staff Geologist

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Seepage Mitigation Plan



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Culver Street Seepage Evaluation

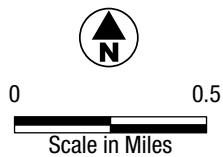
Culver Street
Colfax, California

VICINITY MAP

S2439-05-05

June 2025

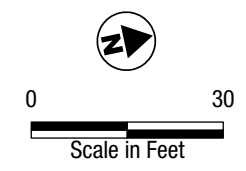
Figure 1





Proposed Development Plan by CHD (11/30/2023)

- Legend**
- ⊗ HA7 Approximate Hand Auger Boring Location
 - Approximate Extent of Seepage through HMA pavement (March 4, 2025)
 - Approximate Project Limits



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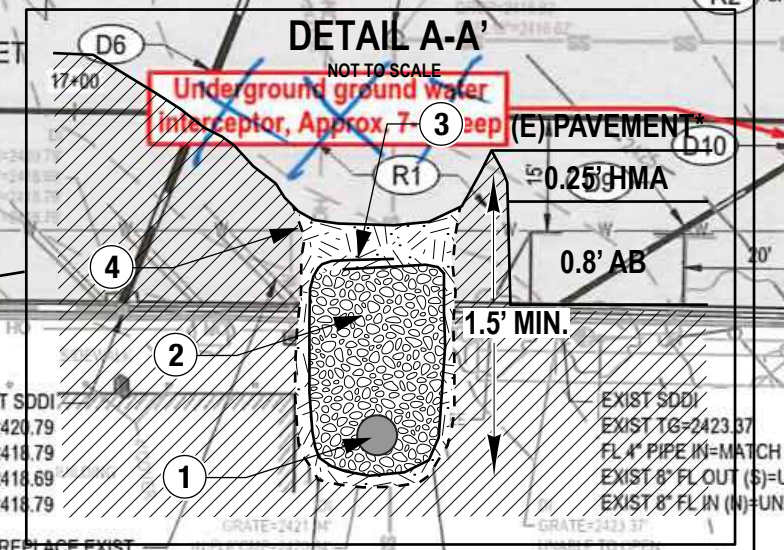
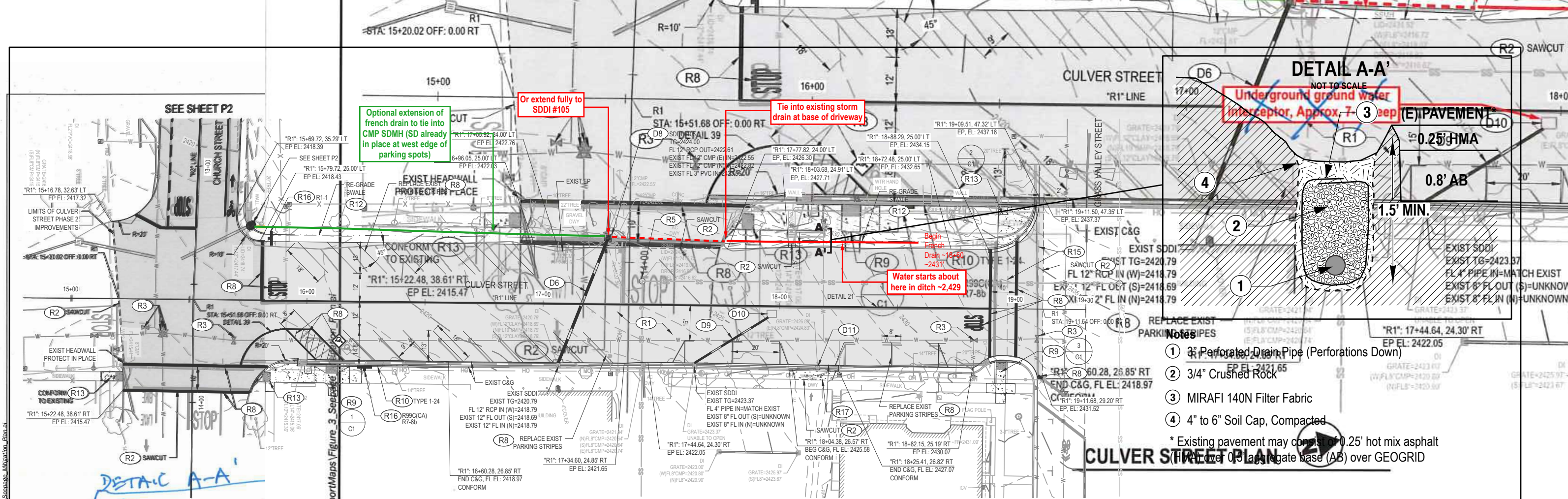
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Culver Street Seepage Evaluation		
Culver Street Colfax, California		
SITE PLAN		
S2439-05-05	June 2025	Figure 2

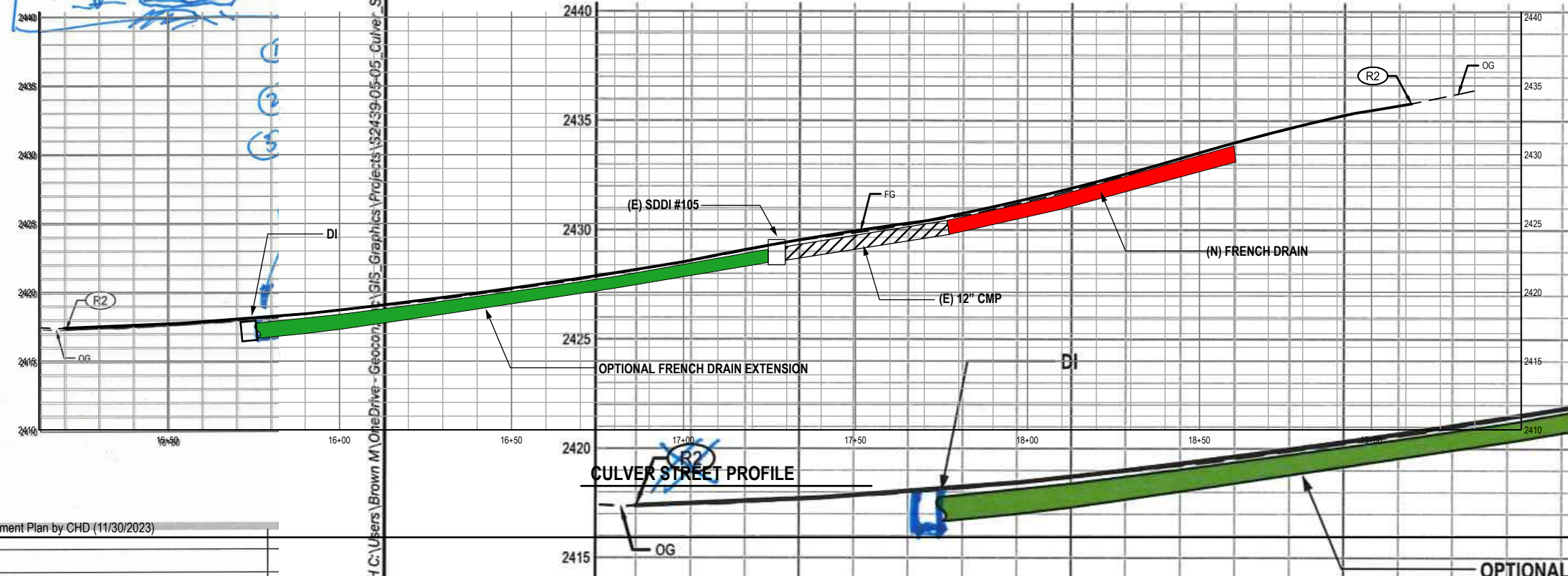
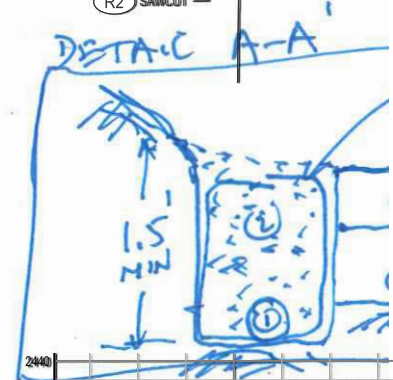
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Proposed Development Plan by CHD (11/30/2023)



- Notes**
- 3" Perforated Drain Pipe (Perforations Down)
 - 3/4" Crushed Rock
 - MIRAFI 140N Filter Fabric
 - 4" to 6" Soil Cap, Compacted
- * Existing pavement may consist of 0.25" hot mix asphalt over 0.5" aggregate base (AB) over GEOGRID



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Culver Street Seepage Evaluation
Culver Street
Colfax, California

SEEPAGE MITIGATION PLAN

S2439-05-05 | June 2025 | Figure 3

OPTIONAL FRENCH DRAIN EXTENSION