

SPRINGVILLE/SPANISH FORK INTERCHANGE: EAST FRONTAGE ROAD REALIGNMENT

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CIVE 4820 . Civil Engineering Capstone II . Spring 2022

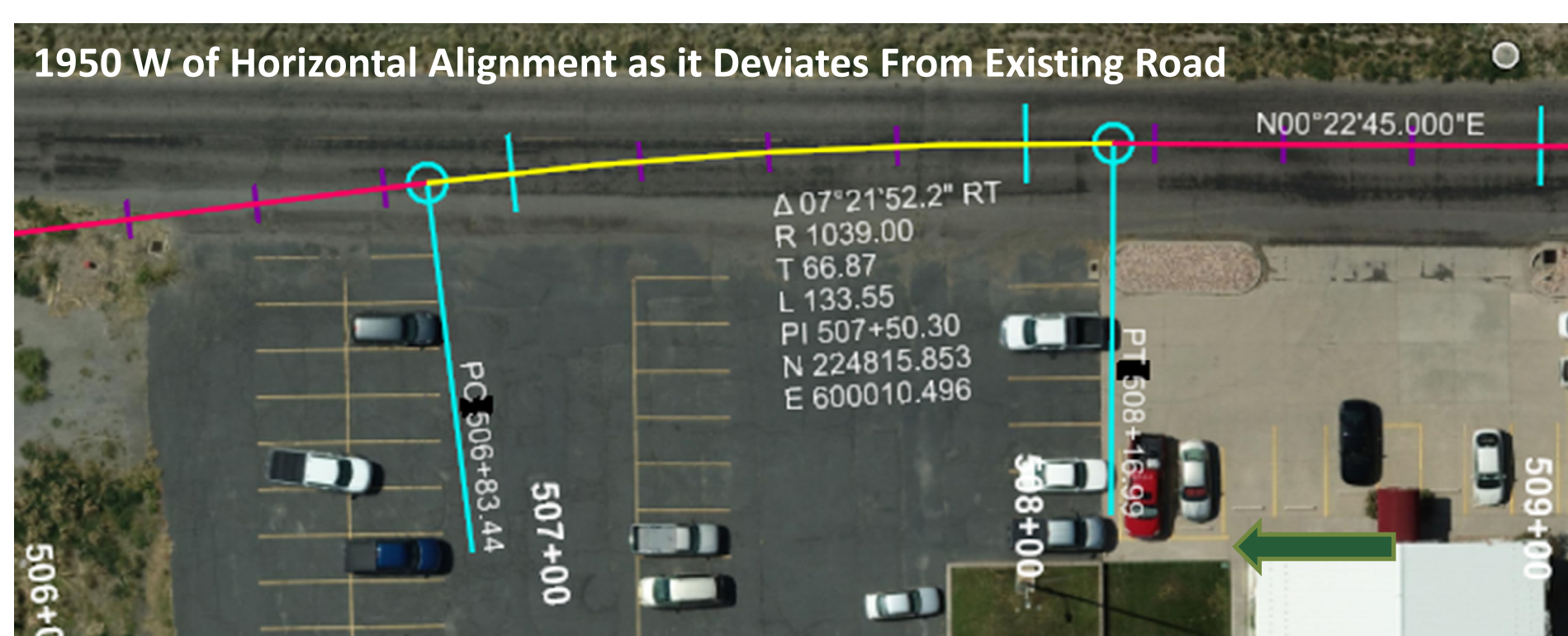
INTRODUCTION

As part of the construction of the Springville Spanish Fork Interchange the East Frontage Road needs to be realigned. An in-depth design and a 3D model of the East Frontage Road was done using Bentley's Open Roads Designer. The design was done for Horrocks Engineers in conjunction with a larger project being performed for the Utah Department of Transportation (UDOT). Some of the challenges in realigning the East Frontage Road included its proximity to the I-15 northbound entrance ramp, flat terrain, proximity to Dry Creek and maintaining access to surrounding properties.

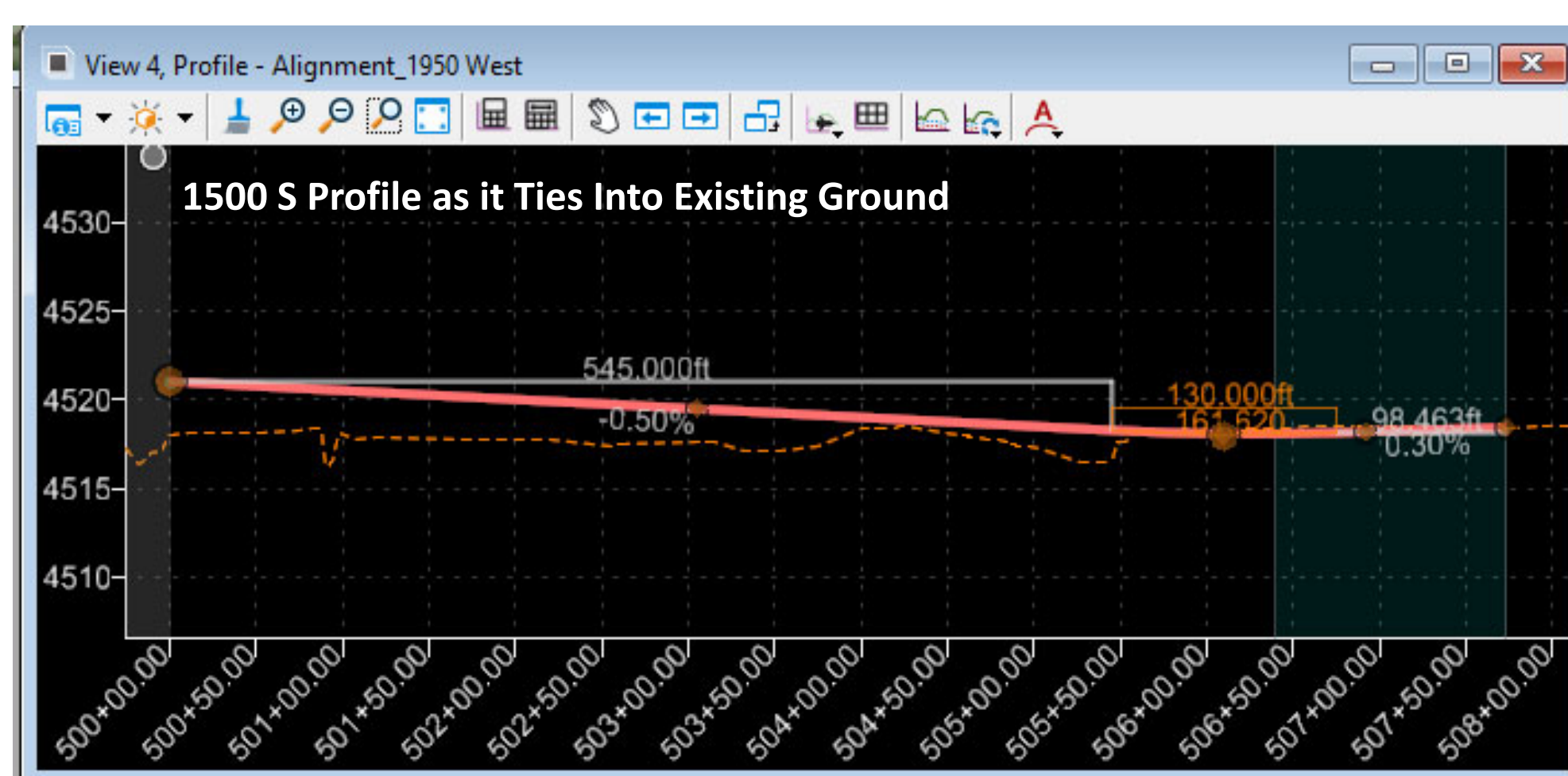
DESIGN PROCESS

Set Design Criteria: A combination of UDOT and Springville City roadway standards were used for the design.

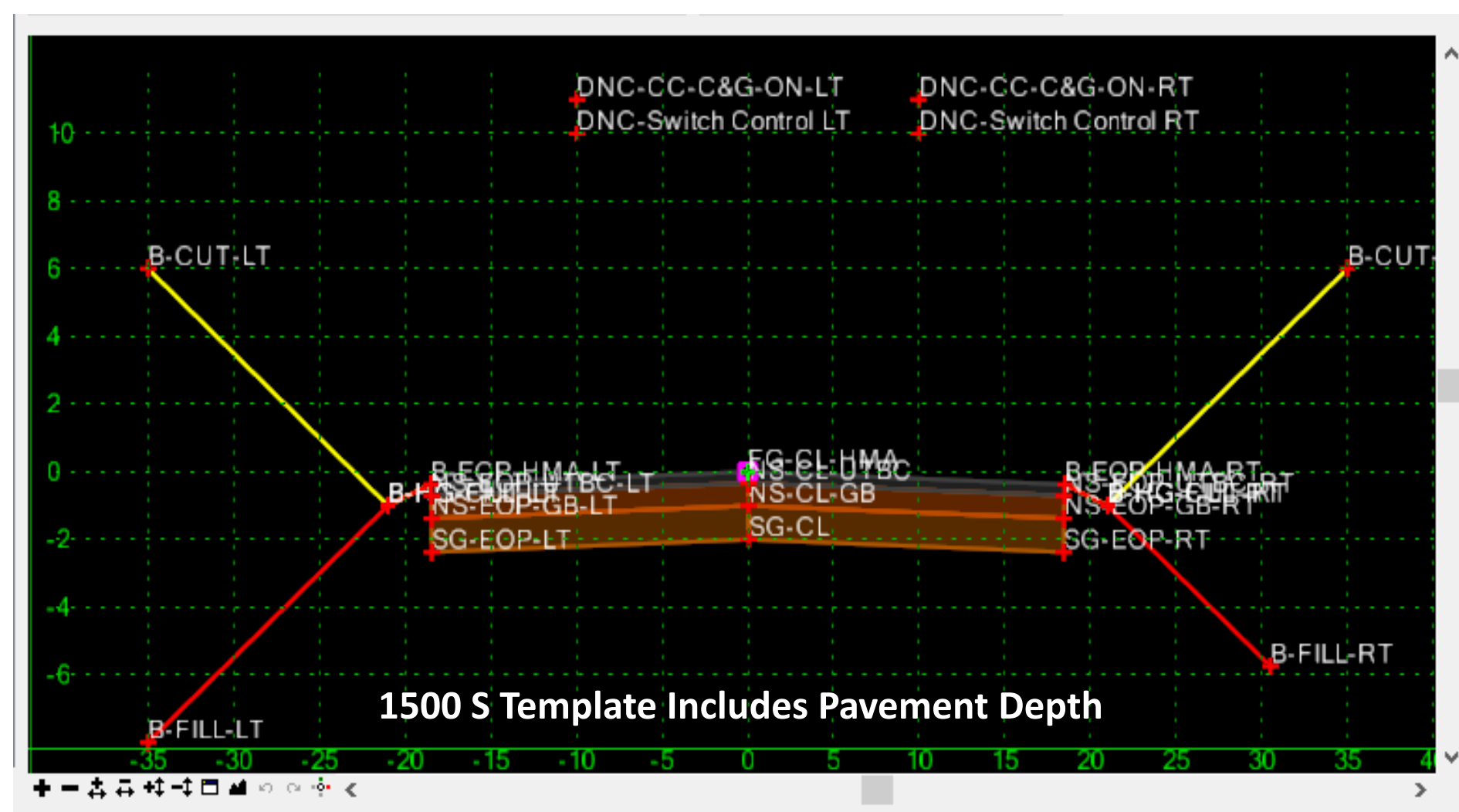
Create Horizontal Alignments: Horizontal alignments define the path the road will follow.



Create Vertical Profiles: Profiles define the elevation of the roadway.



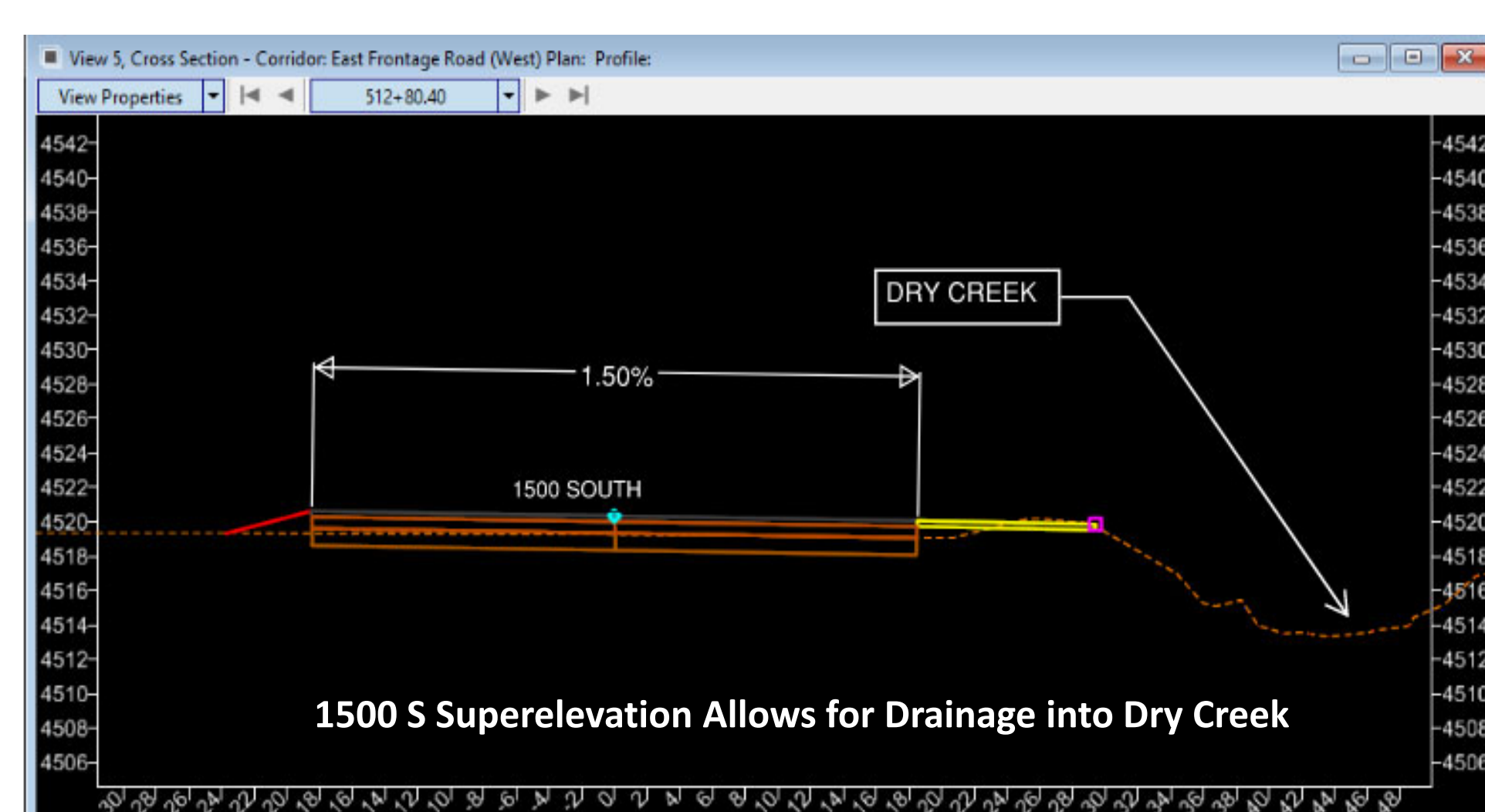
Create Templates: Templates define road dimensions.



Create 3D Model: Combining these elements allows for the creation of 3D models which can be used to see what the road will be like once constructed. 3D models provide roadway quantities which can be used for estimates.

Repeat: The design process was followed many times as the design and model was refined, and changed to meet the needs of UDOT, Springville City, and local property owners.

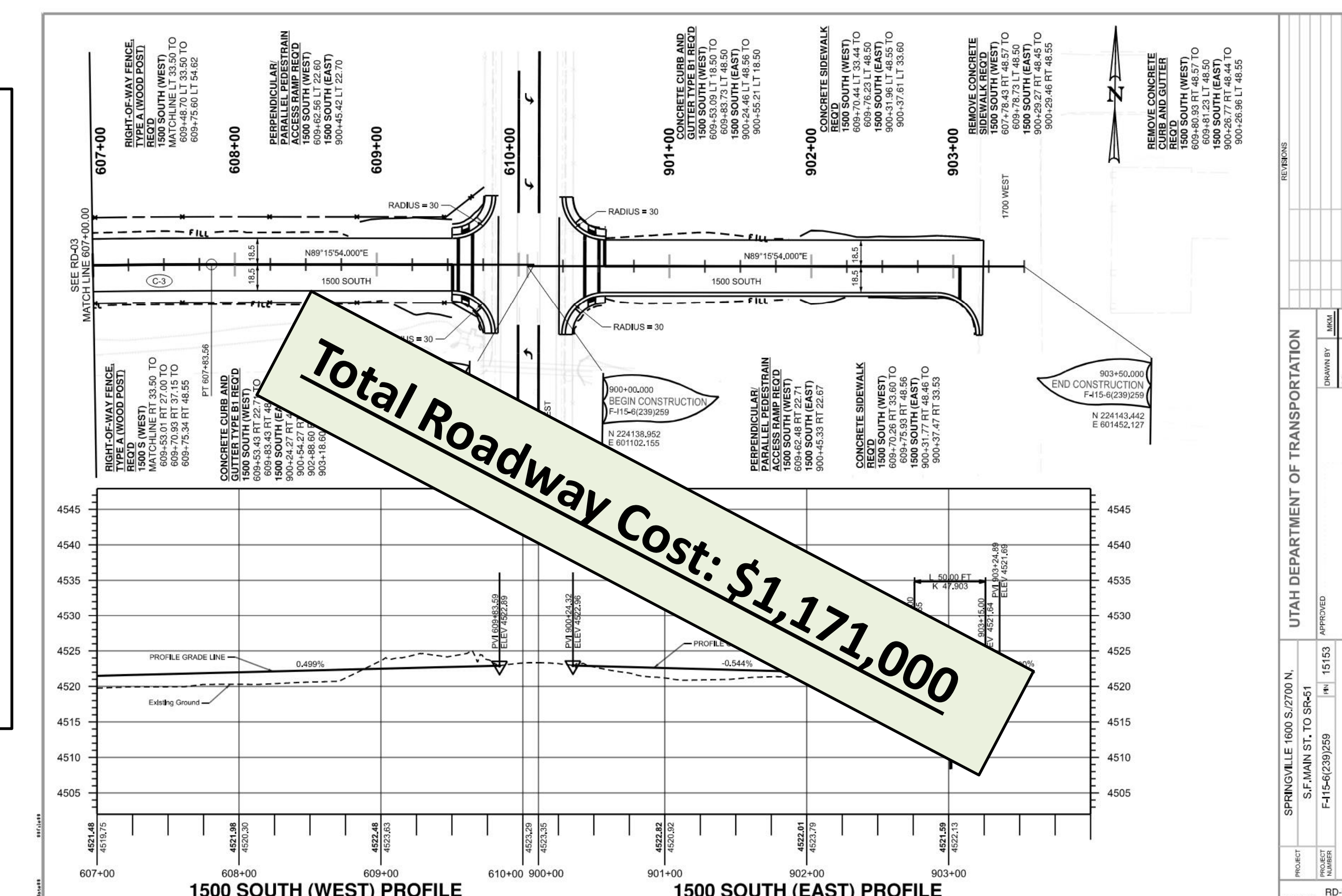
Create Superelevation: Super elevation defines the changes in the slope to of the road laterally.



POST DESIGN

After designing and modeling the East Frontage Road, roadway plan were created. The plans will be given to contractors as they bid on the project in summer 2022.

Based on the design, models and plans, an estimate was created. Estimates ensure that the project can be constructed within the designated budget.



Plan View Design: A 2D plan view design was created parallel to the 3D model to account for the following items:

- Right-of-Way impacts
- Striping
- Fencing
- Removals

The 2D plan view design was then used to create plans and quantify what is needed to construct the road.

