

HINCKLEY TOWN SANITARY SEWER MASTER PLAN

PREPARED FOR:



June 13, 2024

Project #: 2112-024

Prepared by:



www.jonesanddemille.com
1.800.748.5275

TABLE OF CONTENTS

1.	Executive Summary.....	1
2.	Introduction	1
3.	Demographics.....	2
3.1.	Population Growth Based on Historical Delta growth rate	3
3.2.	Millard County Estimated population	3
3.3.	Maximum Potential Growth Scenario	4
3.4.	Hinckley MAGI	5
4.	Existing Collection and Treatment Systems	6
4.1.	Treatment System	6
4.1.1.	Assumptions and Limitations Based on Limited Data	6
4.1.2.	Lagoon Inflow.....	6
4.1.2.1.	Precipitation	7
4.1.2.2.	Pan Evaporation	7
4.1.2.3.	Sewer and Well Flows	8
4.1.2.4.	Lagoon Area, Measured Depth, and Hydraulic Conductivity	9
4.2.	Collection System	12
4.2.1.	Piping.....	12
4.2.2.	Lift Stations.....	13
4.2.3.	Manholes.....	14
5.	Reevaluation and Sizing of Lagoon Cells.....	15
5.1.	Future Influent Scenarios	15
5.2.	Hinckley Midrange growth Rate senerio (most Probable)	15
5.3.	Millard County Senerio.....	16
5.4.	Hinckley Maximum Growth Rate Scenerio.....	17
5.5.	Additional Modeled Exhibits.....	18
5.5.1.	Scenerio 1: Rehabilitate Existing ponds	19
5.5.2.	Scenerio 2: Divide ponds into 3 equal Ponds	20
5.5.3.	Scenerio 3: rehabilitate and split 1 pond	22
5.5.4.	Other Design Considerations.....	23
5.5.5.	Environmental Permitting Considerations	24
5.6.	Lagoon Operation	24
6.	Construction Recommendations.....	25

6.1.	Constructability Sequencing	25
6.2.	Design-Assist	25
7.	Cost Effective Analysis.....	26
7.1.	No Action/ repair without upgrade	26
7.2.	Lagoon Reconstruction	26
7.3.	Discharge MBR.....	26
7.4.	Engineer’s Opinion of Probable Cost	26
8.	Improvements and Implementaion	27
8.1.	0-5 Years	27
8.2.	5-10 Years	28
8.3.	10-15 Years	28
8.4.	15-20 Years	28
8.5.	20-40 Years	29
9.	Conclusion	29
Appendix A. Hinckley Sanitary Sewer System Map Series		A-1
Appendix B. Future Sewer Connections Exhibit		B-1
Appendix C. Engineer’s Opinion of Probable Cost.....		C-1
Appendix D. Water Balance Results Existing Hydraulic Conductivity Back-Calculation		D-1
Appendix E. Water Balance Results: Lagoon Operation for Maximum Growth		E-2
Appendix F. Water Balance Results: Lagoon Operation for Midrange Growth		F-3
Appendix G. Water Balance Results: Lagoon Operation for Minimal Growth		G-4
Appendix H. Data References		G-5

FIGURES

Figure 3-1 Hinckley Historic Population.....	2
Figure 3-2 Hinckley Population Growth Scenarios.....	3
Figure 3-3 Kem C. Gardner Data	4
Figure 3-4 Maximum Growth Population	5
Figure 4-1 Modeled Depth Vs Measured Depth $K=4.03 \times 10^{-6}$ cm/s.....	10
Figure 4-2 Modeled Depth Vs. Measured Depth $K=3.5 \times 10^{-6}$ cm/s.....	11
Figure 4-3 Modeled Depth Vs. Measured Depth $K=4.5 \times 10^{-6}$ cm/s.....	11
Figure 5-1 Midrange Growth Flow Scenario	16
Figure 5-2 Minimum Growth Lagoon Balance	17
Figure 5-3 Maximum Growth Lagoon Balance	18
Figure 5-4 Rehabilitating Existing Ponds.....	19
Figure 5-5 Rehabilitating Existing Working as One.....	20
Figure 5-6 Three Equal Pond Areas.....	21
Figure 5-7 Graphical Depiction Lagoon Working as One	21
Figure 5-8 Rehabilitate Pond 1 and Divide Pond 2	22
Figure 5-9 Rehabilitate Pond 1 and Divide Pond 2 Working Together	23

TABLES

Table 4-1 Precipitation Data	7
Table 4-2 Pan Evaporation	8
Table 4-3 Trough Dimensions	8
Table 4-4 Sewer and Well Flows	9
Table 4-5 Installed Pipe Velocities	12
Table 4-6 Flow for Installed Slopes	13
Table 4-7 Lift Stations	13
Table 4-8 Lift Station Populations	14
Table 4-9 Town Population in 2043 and 2060	14
Table 5-1 Lagoon Cell Redesign	15
Table 5-2 Lagoon Size Exhibits	19
Table 0-1 Kem C. Gardner Growth Rate.....	G-5
Table 0-2 Maximum Growth Rate.....	G-6

1. EXECUTIVE SUMMARY

The Town of Hinckley has completed the 2023 Sanitary Sewer Master Plan with the targets of:

- Evaluating the current and future demographics
- Evaluate the existing collection and treatment systems
- Evaluate future scenarios based on population growth
- Evaluate buildout scenarios
- Advise on future improvement and implications

This Sanitary Sewer Master Plan provides analysis of existing system components including, lagoon function, inflow data, and collection system evaluation. Analysis includes existing and future growth projections. The recommendations in this plan are given to meet the minimum level of service required by the State while providing the best value possible to the Town.

Current flows into the lagoons are based on evaluations and close monitoring between the months of September to December of 2023. These flows with the estimated population growth rate helped determine the future lagoon needs. A water balance was performed to better evaluate the inflow to the lagoons according to state limit¹.

2. INTRODUCTION

The Town of Hinckley, located in Millard County, Utah, is a small community that is home to approximately 617 people, as reported by the 2021 census². Nestled within a desert landscape characterized by a similar topography. Hinckley's proximity to the Sevier River has played a pivotal role in transforming it into the flourishing farming oasis it is today, enabling agricultural activities to thrive within its confines³.

Hinckley installed conventional total containment sewer lagoons and a sewer collection system in the early 1980's. The collection system consists of manholes, eight-to-twelve-inch iron pipe, lift stations and force mains. The lagoons are located near the southwestern portion of the town along W Center Street. The existing lagoons consist of two cells, one primary cell located to the north and a secondary cell located to the south, both of which are approximately 7.17 acres in size.

The system operates on one lagoon cell full time. Supplemental well water is added from the early spring through late fall to ensure there is some surface water on the lagoon, however, despite adding additional water the required depth of three feet cannot be maintained because the infiltration rate is too high. This report will provide recommendations for rehabilitating the system, evaluating its capacity,

¹ Utah Administrative Code (UAC) R-317-3.

² Data from www2.census.gov (Measurement Method: CensusPEPSurvey)

³ Data from <http://www.hinckleypastpresent.org/hinckleyutah.html>

and ensuring compliance with State Rule R317. Additionally, the report will analyze the potential impact of future growth on the sewer system, considering the town's expanding needs and requirements.

3. DEMOGRAPHICS

The historical census data for Hinckley Town in the past 40 years has been sporadic, with growth rates ranging from -14.5% To 4.5% as shown below in Figure 3-1. On average, there has been a growth rate of -0.19% from 1990-2021¹. To make the most accurate predictions for future population and effluent flows, a growth rate of 0.69% from Deltas was utilized.

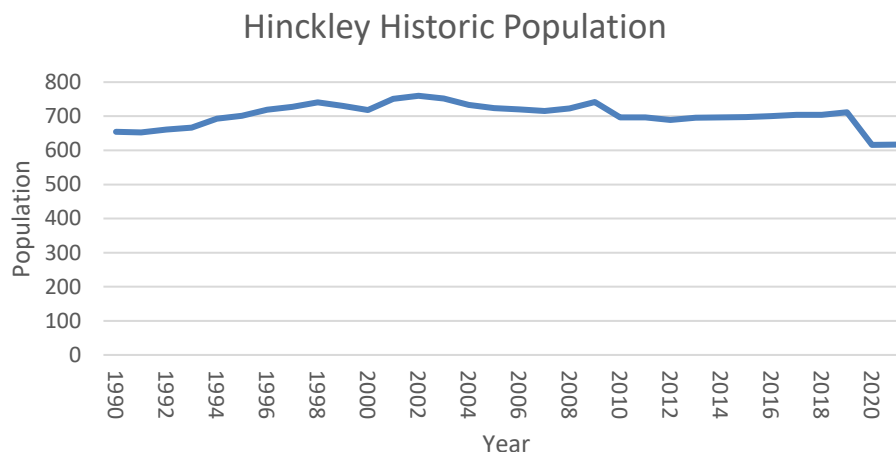


Figure 3-1 Hinckley Historic Population

Three population/effluent growth scenarios are likely for Hinckley town and are analyzed in 3.1 – 3.3. The most likely growth scenario is for the town to grow in conjunction with the neighboring City of Delta due to the energy sector that is present. As the energy sector grows the population will likely upsize proportionally shown in 3.1.

The second scenario is derived from the Kem C. Gardner Institute, which develops and shares economic, demographic, public policy data, and research. According to their projections, Millard County is expected to experience an initial increase in population, followed by several decades of decline. These projections are closely tied to projects in the energy sector ramp up and wind down, shown in 3.2. The most optimistic scenario for population growth is described in 3.3 which would be a result of successful energy sector development, mega-sites, and the industrial park near Hinckley. A comparison of all 3 scenarios is shown below in Figure 3-2 with additional details following.

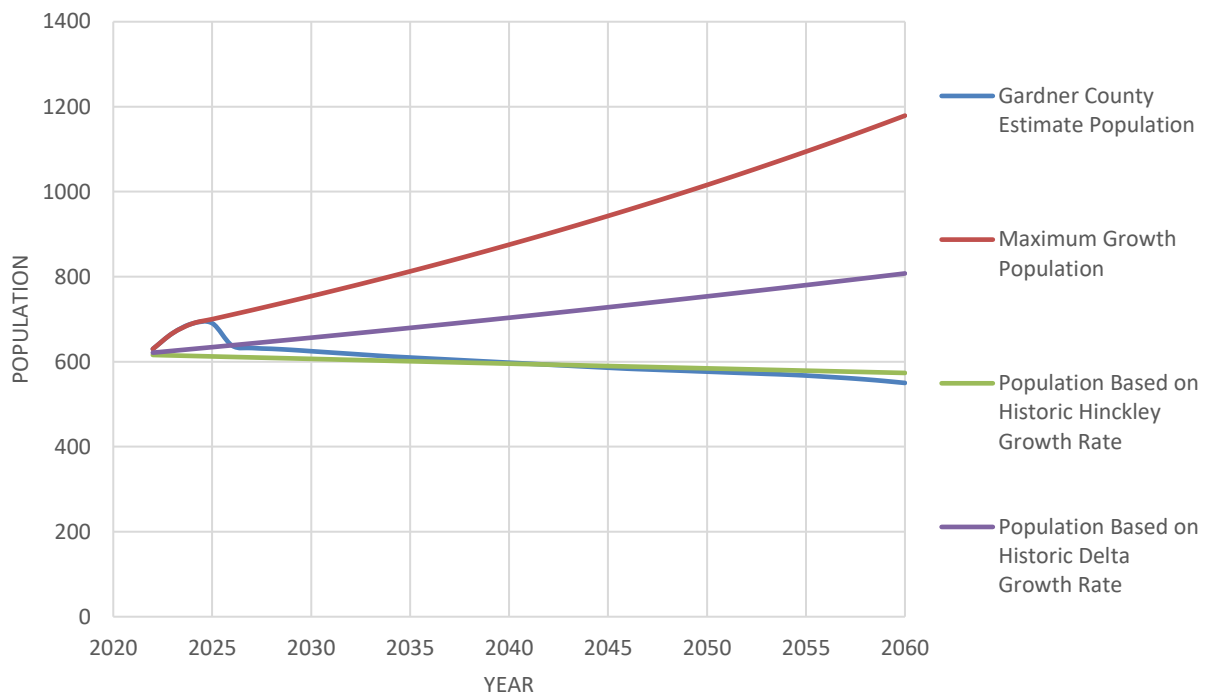


Figure 3-2 Hinckley Population Growth Scenarios

3.1. POPULATION GROWTH BASED ON HISTORICAL DELTA GROWTH RATE

This projection represents the most probable population growth scenario, based on discussions with the Town Council, analysis of historical data, and an understanding of future planned projects. Hinckley is located just 6.2 miles southwest of Delta City Center along HWY-50. Due to the proximity some of Hinckley residents commute to Delta for work. This work includes many aspects of the energy sector including distribution of electricity, processing, mining, agriculture, and other related fields of work.

Considering the interdependence between Hinckley and Delta it is plausible that Hinckley's population will grow alongside Delta. If the demand for housing in Delta increases and reaches saturation, this could lead to a rise in the population of Hinckley. Delta's population was 2,967 in 1990 and grew to 3,678 by 2021, which translates to an average year-to-year growth rate of 0.69%, which has been utilized for this projection. Consequently, the population of Hinckley is estimated to increase from 617 to 808 by the year 2060.

3.2. MILLARD COUNTY ESTIMATED POPULATION

The Millard County Estimated Population projections are provided by Kem C. Gardner Institute, which develops and shares economic, demographic, public policy data, and research. According to their

projections, Millard County is expected to experience an initial increase in population, followed by several decades of decline as shown in Figure 3-3, below.

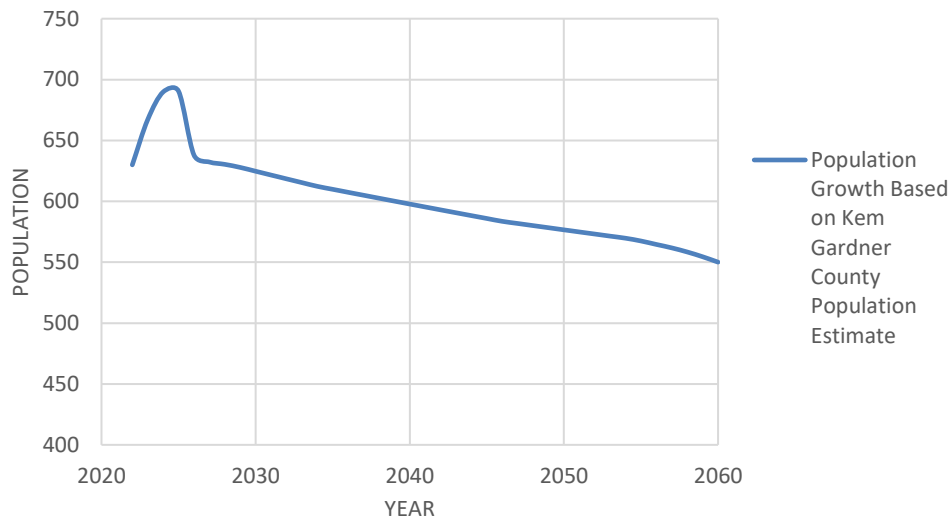


Figure 3-3 Kem C. Gardner Data

This growth estimate is based on growth projections for Millard County from the Governor’s Office of Planning & Budget (GOPB), Utah Long-Term Planning Projections⁴. The year-to-year growth rate is shown below in Appendix H Table 0-1. An initial population increase is expected as projects in the energy sector go into effect, however, an overall population decrease is expected across the county as infrastructure development slows as energy sector projects are completed. Applying the Gardner County model to Hinckley results in a population decrease from 617 to 550 by 2060.

3.3. MAXIMUM POTENTIAL GROWTH SCENARIO

The most ambitious growth scenario is contingent on successful mega-projects in the vicinity, local projects and in turn will spur and maintain growth in Delta and Hinckley. This is shown below in Figure 3-4.

The Utah Long-Term Planning Projection describes two major events/projects in the area. The first is Intermountain Power Plant undergoing a retrofit to run on natural gas which began in 2019 and is expected to complete by July 2025. Another option for the plant depends on the potential development of the salt-domes in the area which will store hydrogen gas generated from electrolysis. The plant can potentially be retrofit for the plant to run on hydrogen gas which if implemented is expected to occur by 2045. Second The report also describes the Millard County Mega Site, which is a stage one certified mega site consisting of 22,000 acres, served by a rail line. There is over a billion dollars of capital ready for the site which is expected to create over 1,000 jobs.

⁴ <https://gardner.utah.edu/wp-content/uploads/LongTermProj-Jan2022.pdf?x71849>

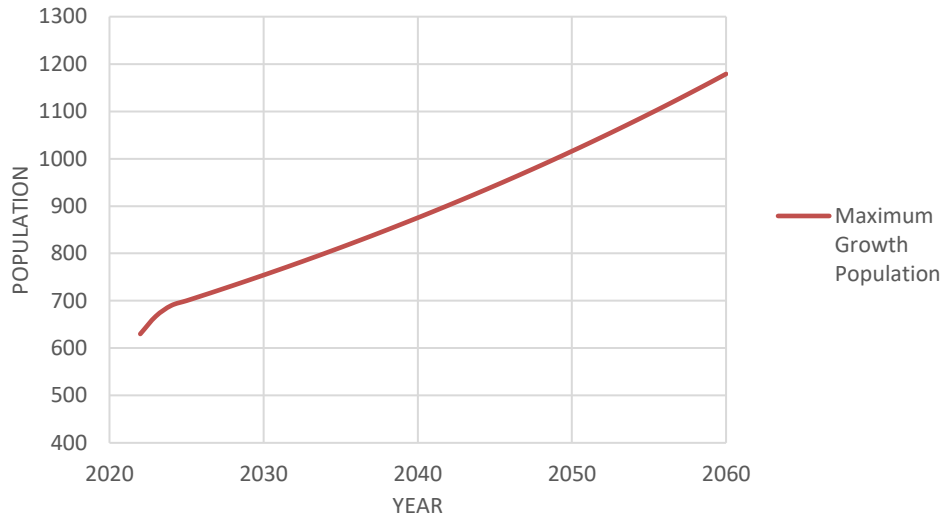


Figure 3-4 Maximum Growth Population

Locally there is potential for potash mining and development on the dry lakebed of the Sevier Lake. Locally, the town is interested in developing and utilizing its industrial park. The success of all these developments would result in a substantial population increase for Hinckley. Year to year growth rates for this scenario are shown below in Appendix H (Table 0-2).

From a starting population of 617 it is expected that population growth will increase following the Gardner estimate through 2024 and continue at a steady 1.5% thereafter resulting in a population of 1,179 by 2060.

3.4. HINCKLEY MAGI

Mean adjusted gross income (MAGI) is used to determine the average income of residents within a geographic area. The State uses a region's MAGI to determine where contributions can be made to avoid overburdening areas where incomes are below average. The statewide MAGI is \$46,500. The MAGI for Hinckley Utah is \$42,000, which is \$3,500 lower than the State average. Many of Hinckley's residents, especially those on the outskirts of town, find themselves in tough circumstances as their income is derived from agriculture which has been negatively impacted by above average temperatures and persistent drought conditions.

4. EXISTING COLLECTION AND TREATMENT SYSTEMS

The wastewater system is divided into two systems: collection and treatment works. Each of these systems were analyzed to evaluate the existing condition, capacity and future needs based on a 20-year and 40-year outlook in accordance with state rule⁵.

4.1. TREATMENT SYSTEM

4.1.1. ASSUMPTIONS AND LIMITATIONS BASED ON LIMITED DATA

Assumptions made in this report account for corrosion due to time, data changes due to storm events that caused equipment damage and challenges with electrical equipment and data logger information. The damage that occurred included a Siemens Mag Meter damaged during a storm in August 2021 that flooded the lift station valve vault. Corrosion was also found to be present after further inspection of the junction box and meter.

To assist the town in completing the master plan, most current and accurate data was advised due to the 2021-meter damage. A Flo-Dar radar meter was installed which includes a radar velocity sensor, ultrasonic level sensor, and data logger. The data logger collected data every 10 minutes in the terminal manhole from Sep 29, 2022, through Dec 25, 2022. This snapshot is not descriptive of all flow scenarios and is representative only of the analysis period during which it was installed. It is recommended that a minimum of one year of data be correctly logged and reported by the town, after the mag meter is repaired, before construction of the lagoons and other systems be undertaken. This additional data will give better understanding for seasonal variations to influent flow.

4.1.2. LAGOON INFLOW

To better assist the town and gather current data for the report, a temporary meter was installed in a manhole located upstream from the terminal lift-station manhole. It is worth noting that out of the 236 residential sewered connections, only three downstream residential lateral connections were not accounted for at the metered manhole. However, these residences were taken into consideration by incorporating a correction factor based on observed flows.

To thoroughly evaluate the capacity of the existing lagoons and assess the potential impacts of future growth, a water balance analysis was conducted according to state rule⁶. This analysis encompassed an examination of various factors such as existing and projected wastewater inflows, precipitation,

⁵ UAC R-317-3

⁶ UAC R-317-3

evaporation, lagoon area, and seepage rate. The purpose of this analysis was to determine appropriate lagoon cell sizes and capacities that would accommodate the town's needs and future developments.

4.1.2.1. PRECIPITATION

Precipitation data was obtained from the Desert Research Institute⁷. Hinckley did not have direct data, so precipitation data is derived from Delta's data due to how close Hinckley and Delta sit. The data from Delta was collected from June 1, 1938 to December 31, 2005 and the average is shown below in Table 4-1.

Table 4-1 Precipitation Data

Month	Average Total Precipitation (in)
Jan	0.56
Feb	0.62
Mar	0.85
Apr	0.84
May	0.9
Jun	0.5
Jul	0.4
Aug	0.54
Sep	0.64
Oct	0.87
Nov	0.58
Dec	0.59
Annual	7.89

4.1.2.2. PAN EVAPORATION

Pan Evaporation Data used for Hinckley was obtained from the Desert Research Institute⁸. To obtain data for Hinckley recorded data from Milford, 67 miles to the south, and Gunnison, located 48 miles East, where used. The evaporation values for these two locations were averaged to predict the pan evaporation for Hinckley, see Table 4-2.

⁷ <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ut3611>

⁸ https://wrcc.dri.edu/Climate/comp_table_show.php?stype=pan_evap_avg

Table 4-2 Pan Evaporation

Month	Gunnison Pan Evaporation (Inches)	Milford Utah Pan Evaporation (Inches)	Average Pan Evaporation (Inches)
Jan	0.00	0.00	0.00
Feb	0.00	0.00	0.00
Mar	0.00	0.00	0.00
Apr	5.10	7.47	6.29
May	7.23	10.22	8.73
Jun	8.70	13.54	11.12
Jul	9.65	15.47	12.56
Aug	8.26	13.24	10.75
Sep	6.03	9.88	7.96
Oct	3.81	6.16	4.99
Nov	0.00	2.32	1.16
Dec	0.00	0.00	0.00

Standard daily pan evaporation is measured using a four-foot diameter Class A evaporation pan. The pan water level reading is adjusted when precipitation is measured to obtain the actual evaporation. Most Class A pans are installed above ground, allowing effects such as radiation on the side walls and heat exchanges with the pan material. These effects tend to increase the evaporation totals. The amounts can then be adjusted by multiplying the totals by 0.70 or 0.80 to better estimate the evaporation from naturally existing surfaces such as a shallow lake, wet soil or other moist natural surfaces. For this analysis, evaporation depths were multiplied by a correction factor of 0.75.

4.1.2.3. SEWER AND WELL FLOWS

Total sewer flow was measured using the flow meter setup described in 4.1.2. The dimensions of the manhole trough were measured and calibrated based on observed flow conditions at the time of meter setup. The trough appeared well worn from years of flow a manning's value⁹ of 0.016 was selected based on the observed condition of the concrete trough which had a bit of exposed aggregate.

Table 4-3 Trough Dimensions

Trough Diameter	12.00	Inches
Manning's Roughness	0.016	
Channel Bottom Slope	0.0115	Approximate

⁹ https://www.fsl.orst.edu/geowater/FX3/help/8_Hydraulic_Reference/Mannings_n_Tables.htm

Using the appropriate dimensions and calibration, the flow meter was set up to record flows every 10 minutes from Sep 29, 2022, through December 25, 2022. The average observed flow was .102 CFS, which includes supplemental well water. Supplemental well water is added by the Town to help maintain a water level in the sewer lagoon to aid with treatment. Well water was added from September through November 28, 2022. To understand the flow coming to the lagoon, sewer water and well water were monitored and well water had to be subtracted out to find sewer flow. The Town uses a totalizer to keep track of supplemental well water added to the lagoons and is recorded multiple times a week by Town maintenance personnel. The total additional water added to the lagoons during the analysis period was 2,570,624 gallons, which includes a correction for the period of November 13, 2022, through November 17, 2022 when the supply hose came off. The total back-calculated flow into the lagoons was 5,817,410 gallons, subtracting the additional well water flows yields a volume of 3,246,786 gallons of sewer flow from residents and or infiltration. This results in an average sewage flow of 0.058 CFS during the analysis period which accounts for the 3 unmetered connections.

Table 4-4 Sewer and Well Flows

Flow	Gallons
Sewer Flow	3,246,786
Well Flow	2,570,624
Total	5,817,410

4.1.2.4. LAGOON AREA, MEASURED DEPTH, AND HYDRAULIC CONDUCTIVITY

Each lagoon cell has an approximate bottom area of 7.17 acres. Using the total inflow described in 4.1.2; adding the monthly precipitation described in 4.1.2.1; subtracting the pan evaporation described in 4.1.2.2; allows us to back calculate the hydraulic conductivity of the lagoon cells.

Using the average monthly depth, Excel was employed to back calculate the hydraulic conductivity. The model is based on a mass balance that projects lagoon depth based on all the factors mentioned in 4.1. The measured depth was compared to the projected depth and error minimized using a solver to find the best match hydraulic conductivity for the lagoon cells. Figure 4-1 shown below, shows that the predicted depth correlates very well with the measured depth.

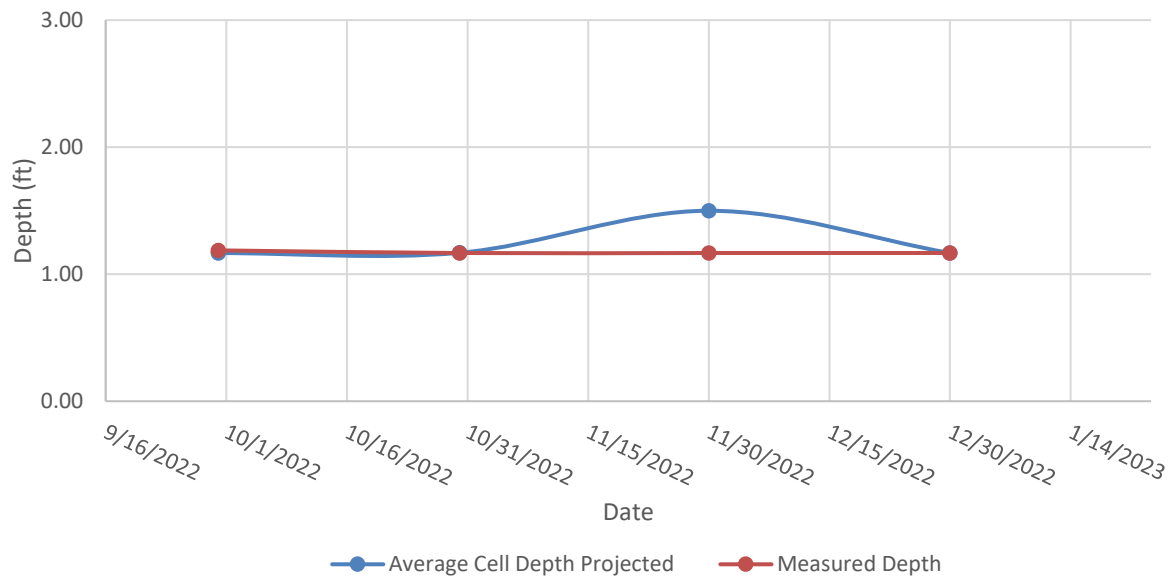


Figure 4-1 Modeled Depth Vs Measured Depth $K=4.03 \times 10^{-6}$ cm/s

The hydraulic conductivity was back calculated to be 4.03×10^{-6} cm/s which is 403% of the allowable maximum described in the State Rule¹⁰. Figure 4-2 below shows that with a hydraulic conductivity of $K=3.5 \times 10^{-6}$ cm/s the projected depths are higher than the measured depth.

¹⁰ UAC R317-6, (groundwater Quality Protection Rules)

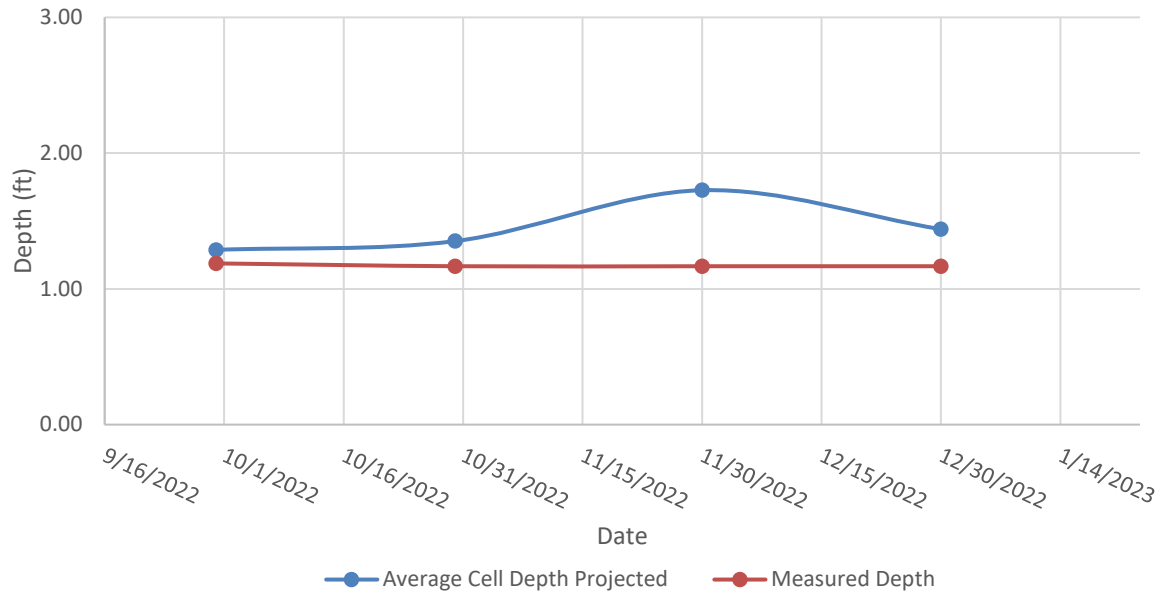


Figure 4-2 Modeled Depth Vs. Measured Depth $K=3.5 \times 10^{-6}$ cm/s

Figure 4-3 shows the projected lagoon depth is less than the measured which indicates that the hydraulic conductivity is not $K=4.5 \times 10^{-6}$ cm/s.

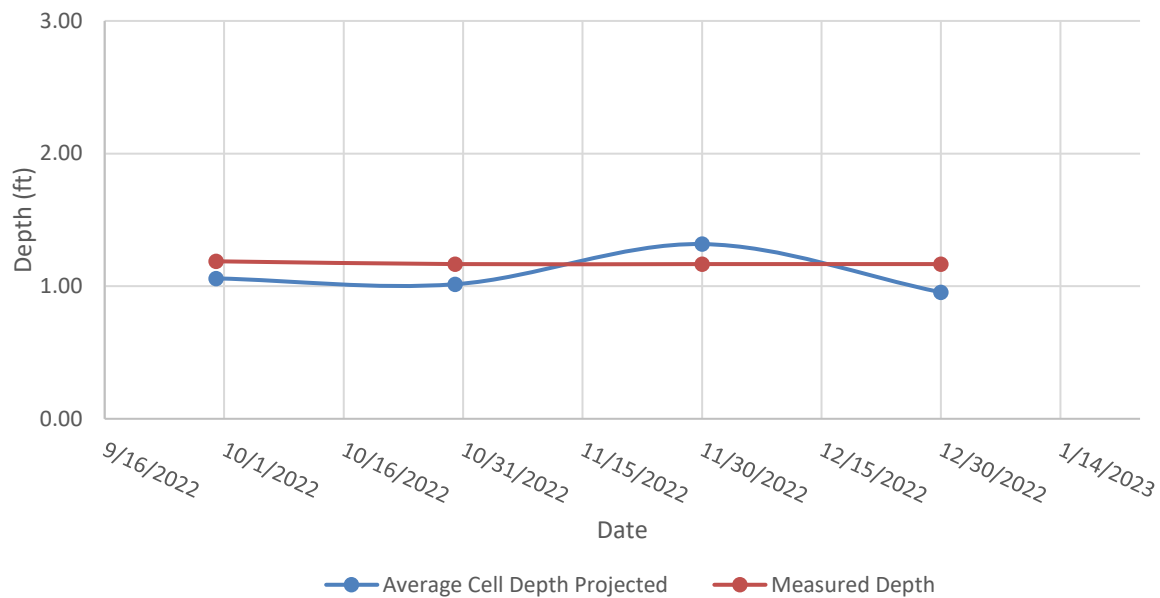


Figure 4-3 Modeled Depth Vs. Measured Depth $K=4.5 \times 10^{-6}$ cm/s

The above figures indicate that the hydraulic conductivity is between $3.5-4.5 \times 10^{-6}$ cm/s. This is well above the state maximum and is likely a reason the town has been having trouble maintaining sufficient

depth on the primary cell. The secondary cell also struggles to retain water, town personnel have reported that supplemental water has been required to maintain any depth on that cell as well. Based on the calculations above, rehabilitating the existing lagoon system to bring the seepage rate of the lagoons to within state allowable tolerances would allow for less pumping of the well water, increase the operational depth of the lagoon cells, and improve the treatment process.

4.2. COLLECTION SYSTEM

A series of manholes, lift stations, iron pipe, and force mains make up the Hinckley Sewer System. Some of the equipment has been updated with modern components. All four lift stations had pumps, electrical components, and wet well access lids replaced in 2015 to 2016. This section will evaluate the existing condition of the piping, lift stations, and manholes in accordance with state rule¹¹.

4.2.1. PIPING

Most of the Sewer collection system consists of gravity ductile or cast-iron piping. Observation of inlet and outlet piping indicates that the location where the temporary flow meter was installed that the pipe in this section has held up well and has experienced little corrosion or deterioration. Force mains are either PVC or ductile iron and have no known issues at the time of this report. The as-built drawings for the Hinckley sewer system indicate that much of the pipe was installed at slopes shallower than those allowed in State Code¹². State code requires that pipe slope be sufficient to provide a minimum velocity of two feet per second to scour solids and promote positive pipe flow when flowing full. The approximate totals of under-sloped pipe are tabulated in Table 4-5. Recalculating the average full flow velocities using a Manning's n value of 0.013 per R317 results in velocities lower than 2 feet per second.

Table 4-5 Installed Pipe Velocities

Diameter (Inches)	Length (ft)	Installed Slope	Recommended Slope	'as-built' Sheets	Installed Velocity When Full	Notes
8	7,050	0.280%	0.334%	C8-C15, C17, C22, C23, C25	1.84	
10	950	0.20%	0.248%	C-16	1.80	
12	5,300	0.15%	0.194%	C2-C6	1.76	
10	600	0.18%	0.248%	C-19	1.71	
8	250	0.18%	0.334%	C-25	1.47	Between Grant Avenue and Washington Avenue

¹¹ UAC R317-3

¹² UAC Table R317-3-2.3(D)(4)

Approximately 14,150 ft or 2.68 miles of pipe have been installed at slopes shallower than those required in R317. The most concerning section is an 8" run of 250 ft located between Grant Avenue and Washington Avenue and is sloped at .0018 ft/ft. Operators should pay careful attention to these sections and record blockages and flow issues. It is not economically feasible to replace this much of the collection system at minimum slopes, therefore careful inspection and maintenance of these pipe sections will be required to ensure flow is conveyed as efficiently as possible.

Table 4-6 Flow for Installed Slopes

Diameter (Inches)	Length (ft)	Installed Slope	Recommended Slope	'as-built' Sheets	Total Residents at 100 GPCD	Peaking Factor	Notes
8	7,050	0.280%	0.334%	C8-C15, C17, C22, C23, C25	1036	4.00	Collector
10	950	0.20%	0.248%	C-16	2540	2.50	Main
12	5,300	0.15%	0.194%	C2-C6	3577	2.50	Main
10	600	0.18%	0.248%	C-19	2410	2.50	Main
8	250	0.18%	0.334%	C-25	831	4.00	Collector

The total number of residents that can be served by the system is limited by the pipes that were installed at slopes flatter than those required in R317. Based on installed sewer locations the town has much room to expand and develop based on its gravity flow system using a flowrate of 100 gallons per capita per day (GPCD) as required by R317.

4.2.2. LIFT STATIONS

There are four lift stations that serve the Town of Hinckley. Lift station pumps were causing significant issues prior to a retrofit that modernized the pumps between 2016-2017. Horsepower, volume delivery, and total dynamic head were increased for all lift station pumps across the town. All installed lift station pumps are Flygt 4" NP3102.185 with 464 hard iron impellers. Each pump is rated at 5 HP generating 3.3HP at the shaft which will push 295gpm at 28.9 total dynamic head. Pump controls and electronics have been modernized.

Table 4-7 Lift Stations

Lift Station	Location	Number of Pumps	Individual Pump HP	HP @ Shaft	TDH (ft)	GPM/pump
Main Station	Wilson Avenue	2	5	3.3	28.9	295
South Collector Station	Main Street and 1000 N	2	5	3.3	28.9	295
North Collector Station	Grant Avenue	2	5	3.3	28.9	295
Industrial Park Lift Station	Main Street and 4000 W	2	5	3.3	28.9	295

State code requires pumps and motors to be sized for 10-year peak flows. Without inflow data, a value of 100 GPCD was used in conjunction with a peaking factor of 4, per R317, to determine the peak flows and maximum population served by each lift station.

Table 4-8 Lift Station Populations

Lift Station	Location	Peaking Factor	GPCD	Maximum Population
Main Station	Wilson Avenue	4	100	1062
South Collector Station	Main Street and 1000 N	4	100	1062
North Collector Station	Grant Avenue	4	100	1062
Industrial Park Lift Station	Main Street and 4000 W	4	100	1062

At the time of this report Hinckley had a population of 617. The controlling lift station for growth is the Terminal Lift station on Wilson Avenue that will be able to support an additional 445 residents. A summary of the growth scenario populations in 2043 and 2060 is tabulated in table 3.

Table 4-9 Town Population in 2043 and 2060

Growth Scenario	2043 Population	2060 population
Minimum (Gardner Estimate)	591	550
Midrange (Delta Estimate)	718	808
Maximum (Successful Mega Projects)	915	1179

The Current Lift station pump configuration will serve the Town well now as well as 20 years into the future. If unprecedented growth continues beyond 2043, following the maximum growth scenario, the terminal lift station pumps will need to be upsized to keep up with flow.

4.2.3. MANHOLES

Observations of the terminal manhole where the flow meter was installed indicate some concrete and steel corrosion due to hydrogen sulfide gas. Infiltration was observed, however did not appear excessive. This manhole cover was non-vented as it is in a drainage swell. Hydrogen sulfide rapidly deteriorates concrete, steel, and iron pipes. As the system wears out and replacement pipe/manholes are installed. It is recommended that the town replace non-vented manholes with materials more resistant to corrosion. Materials resistant to corrosion include, but are not limited to, PVC pipe in lieu of iron pipe, fiberglass manholes, and precast concrete manholes with direct corrosion inhibitors (DCIs) included in the mix design. All manholes are concentric four feet in diameter without a built-in ladder structure. Future manholes should include steps for increased safety and ease of access. All manholes should be catalogued and inspected every five years, minimum. Detailed notes of the trough condition, side walls, surcharging (if present), infiltration, and observed flow characteristics should be logged by city personnel.

5. REEVALUATION AND SIZING OF LAGOON CELLS

The most important item to address for the town sewer system will be the redesign and rehabilitation of the lagoon system. The current infiltration rate is too high, and the current lagoon layout does not support the potential growth scenarios well. The current lagoon system consists of two 7.17 acre cells with a hydraulic conductivity roughly four times the state allowable maximum. A proposed improvement could consist of three cells in place of the two and new clay liner with areas and hydraulic conductivities described in Table 5-1. The north cell will retain its overall geometry and area while a dike running from North to South could be used to split the South Cell into a 2.20 acre and 4.30-acre cell. The lagoon cells are fed from a force main from the terminal lift station making it possible to make any cell primary as part of the design effort with the proper influent pipe routing.

Table 5-1 Lagoon Cell Redesign

Lagoon Cell	Cell Area 3-foot Depth (Acres)	Target Hydraulic Conductivity cm/s
1	7.17	6.7×10^{-7}
2	2.20	3.0×10^{-7}
3	4.3	6.0×10^{-7}

5.1. FUTURE INFLUENT SCENARIOS

There are three likely influent scenarios from the time of this report through 2060. They are based on the population increase scenarios described in the preceding section. There are approximately 69 unsewered connections that may be added into the network at some future point. Each growth scenario is described in the following sections. The lagoon system reengineered based on the parameters from Table 5-1 will serve each potential growth scenario well. The lagoon balance accounts for inflow from sewer, infiltration, evaporation, cell seepage, and precipitation.

5.2. HINCKLEY MIDRANGE GROWTH RATE SENERIO (MOST PROBABLE)

In this scenario the effluent will grow proportionally to the population increase described in 3.1. In addition to the population growth, it is anticipated that 35 of the presently un-sewered residences will be added to the network by 2028. Figure 5-1 below shows that the re-engineered lagoon will operate on two cells through 2060 with supplemental water added.

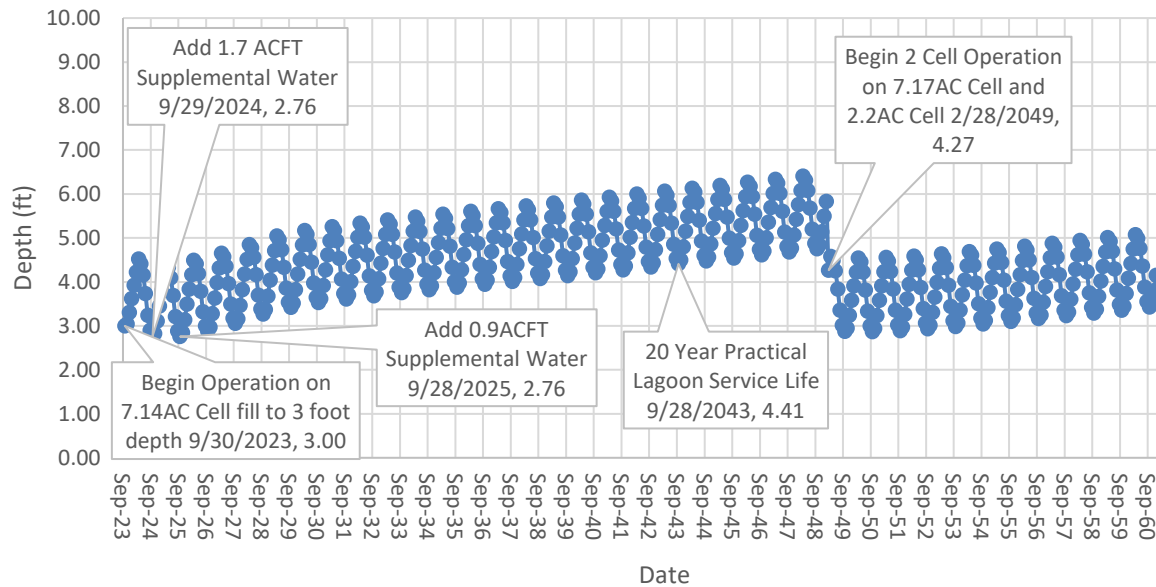


Figure 5-1 Midrange Growth Flow Scenario

5.3. MILLARD COUNTY SENERIO

This scenario is based on the growth scenario described in 3.2. It is possible that the Town population grows initially and then decreases in conjunction with the County population growth estimate produced by Kim C. Gardner institute. In this scenario, the goal is to analyze the system based on a minimal flow scenario. It is also assumed that no additional unsewered connections within the town will be added to the system. The re-engineered lagoon will function effectively in a minimal flow scenario given that the proper cells are employed and well water is added, when necessary, shown below in Figure 5-2.

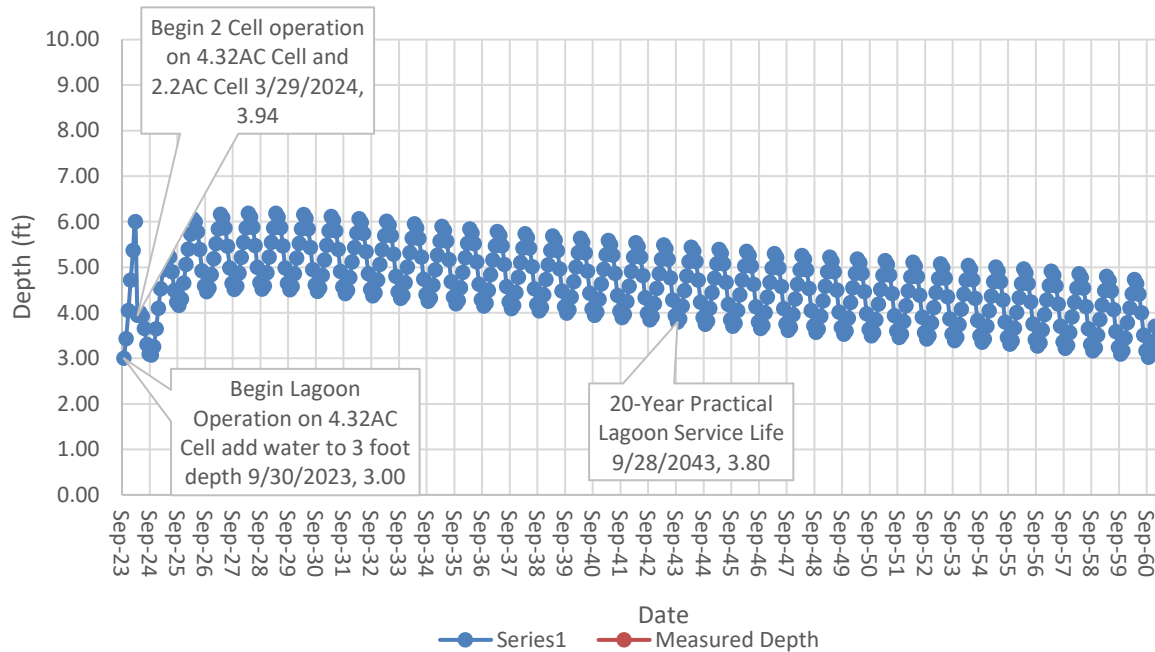


Figure 5-2 Minimum Growth Lagoon Balance

5.4. HINCKLEY MAXIMUM GROWTH RATE SCENERIO

This scenario is based on the potential for maximum growth and successful mega-projects as described in 3.3. The effluent is expected to increase proportionally to the maximum population growth scenario. This Scenario adds an additional 69 previously unsewered connections to the system in addition to the increased flow from population. This is a maximum growth scenario is not likely to continue at such a pace for multiple decades in a row. However, it is worth noting that the reengineered lagoon will support this scenario until 2056 or 33 years from implementation. When an additional cell is required, or aeration system is installed to run a depth over 6 feet in the secondary cells. If an aeration system is installed or additional cells added the system could continue operation to 2060 and beyond as shown in Figure 5-3.

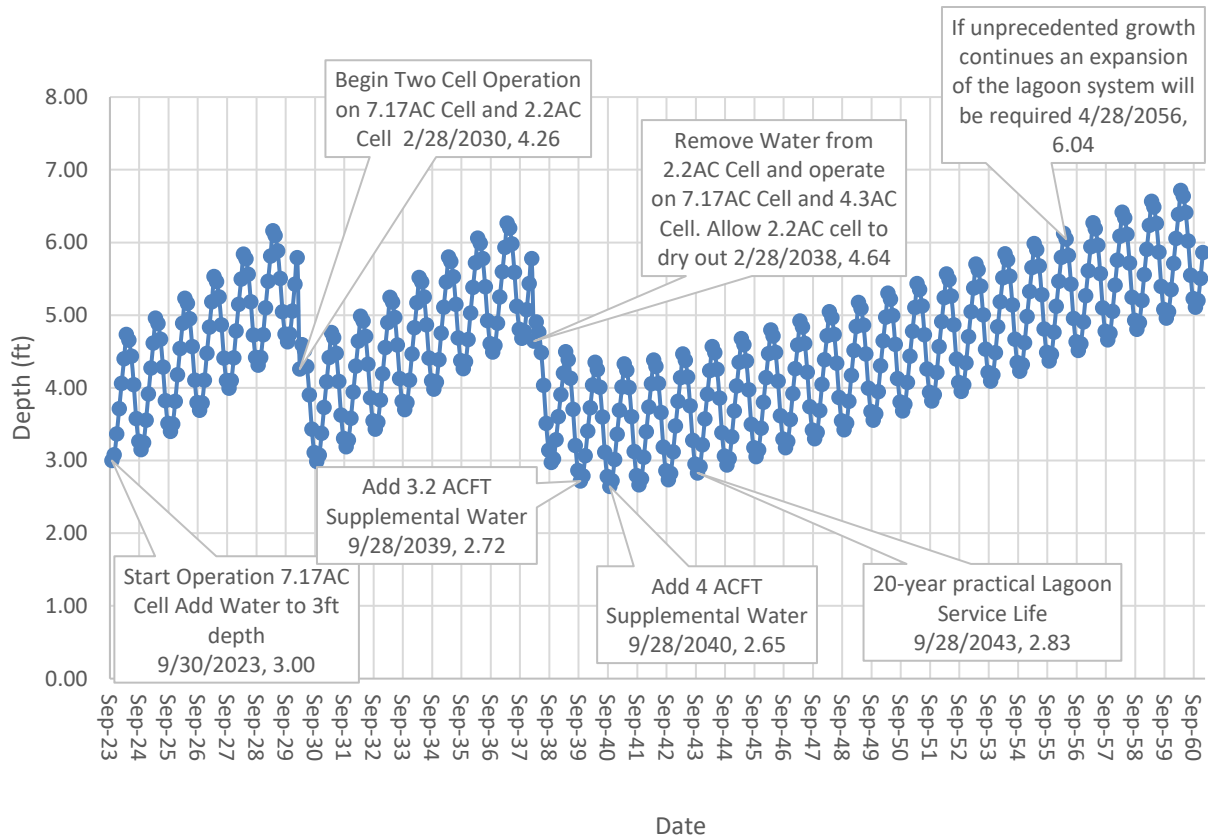


Figure 5-3 Maximum Growth Lagoon Balance

5.5. ADDITIONAL MODELED EXHIBITS

For the following scenarios shown below an assumed population growth rate of 0.69% was continued to be implemented. These exhibits do not account for the addition of well water to allow the lagoon to function. These exhibits also account for the current area where the lagoons are present. For the below exhibits a hydraulic conductivity change varies with the model to reflect many possible scenarios, as shown in Table 5-2.

Table 5-2 Lagoon Size Exhibits

	Lagoon Cells	Cell Area 3 Foot Depth (Acres)	Target Hydraulic Conductivity (cm/s)
Scenario 1	1	7.17	6.00E-07
	2	7.17	6.00E-07
Scenario 2	1	4.79	8.00E-07
	2	4.79	8.00E-07
	3	4.79	8.00E-07
Scenario 3	1	7.17	6.00E-07
	2	2.8	6.00E-07
	3	2.8	6.00E-07

5.5.1. SCENARIO 1: REHABILITATE EXISTING PONDS

Scenario 1 shown below evaluates the option of rehabilitating the existing ponds. The graph below indicated that with a hydraulic conductivity of 6×10^{-7} cm/s that pond one will fill up rather quickly and stay relatively close to a 6-foot max. However, pond 2 appears to run dry every year so this option is not recommended.

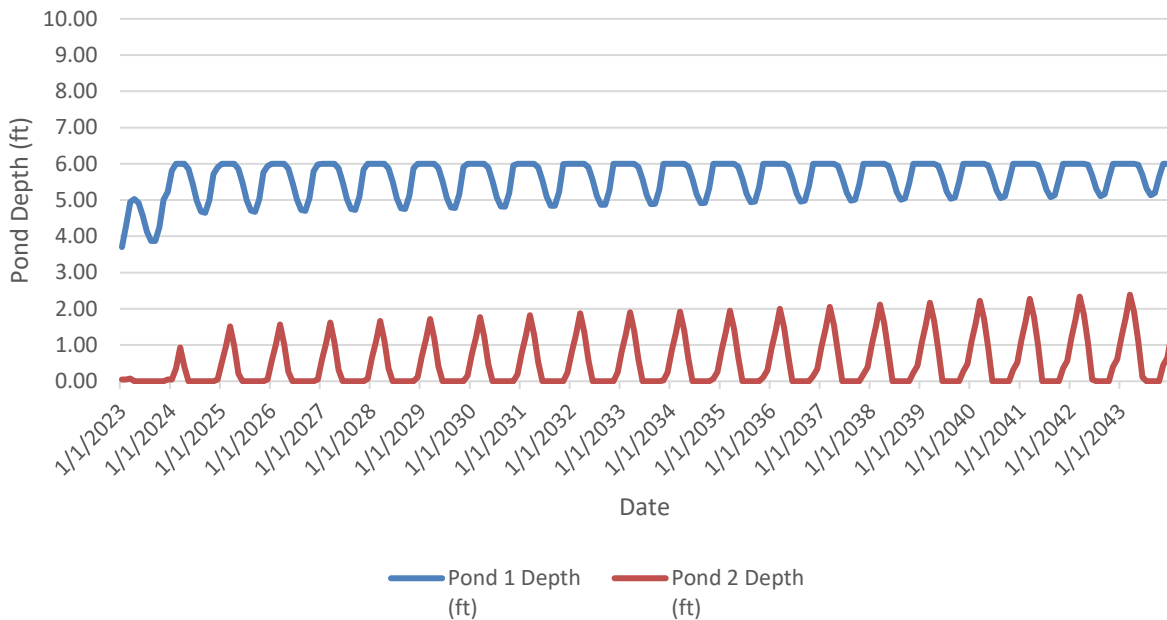


Figure 5-4 Rehabilitating Existing Ponds

Further, in the graph shown below, the ponds as they work together show there is an initial increase until pond 2 is in service. After pond 2 is in service all the ponds dry out at least once a year and the average depth never reaches above the required three-foot mark for the sewage breakdown to happen properly.

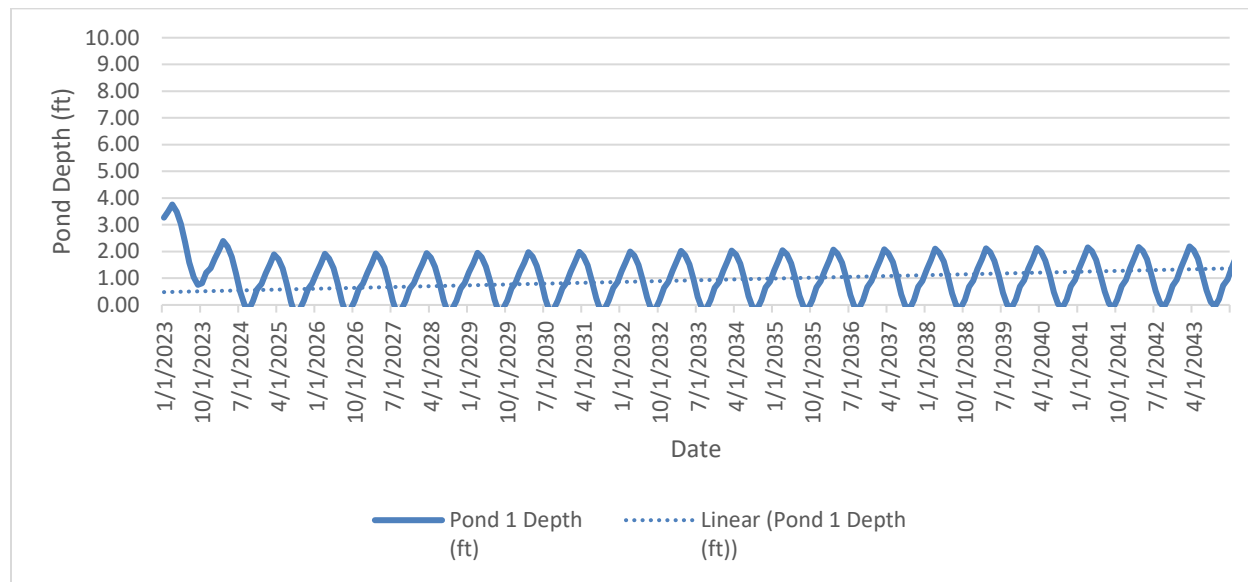


Figure 5-5 Rehabilitating Existing Working as One

5.5.2. SCENERIO 2: DIVIDE PONDS INTO 3 EQUAL PONDS

Scenario 2 shows the existing area divided into 3 equal areas of 4.78 acres. For this model a hydraulic conductivity of 8×10^{-7} cm/s was used. This model indicates that two ponds would suffice until well past 20 years so the third pond would not be recommended to be built until a future time. Figure 5-6 below shows pond 1 would fill quickly and then pond 2 would go into use roughly 10 months later, allowing for sufficient construction time. This option would help eliminate the need to add supplementary well water.

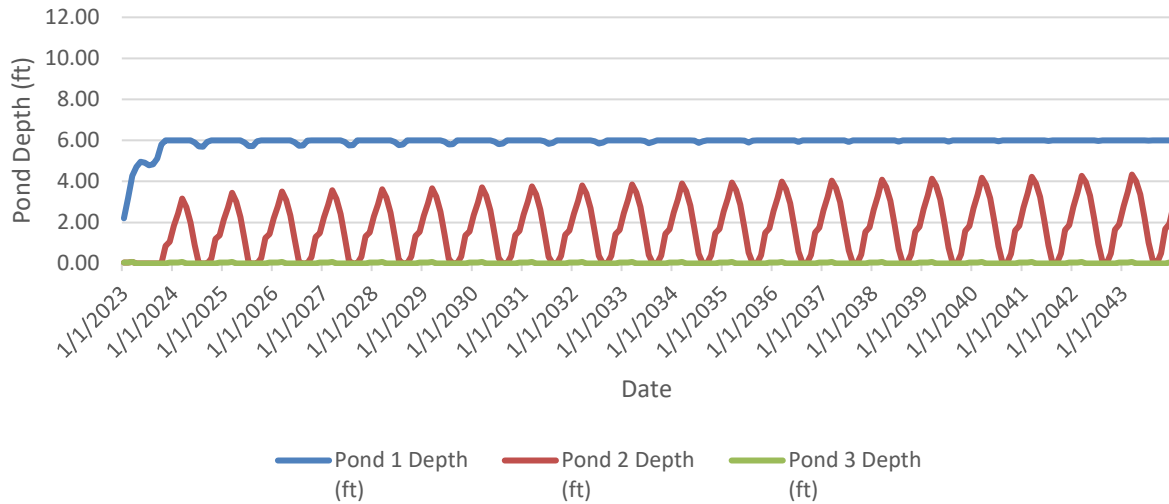


Figure 5-6 Three Equal Pond Areas

The graph below shows what the water level would look like if the ponds were working at the same time instead on one filling and then feeling the other as needed. Figure 5-7 shows a trend-line showing the average depth of both pond 1 and pond 2. From the trend line we can see that the average is close to the 3-foot recommended height.

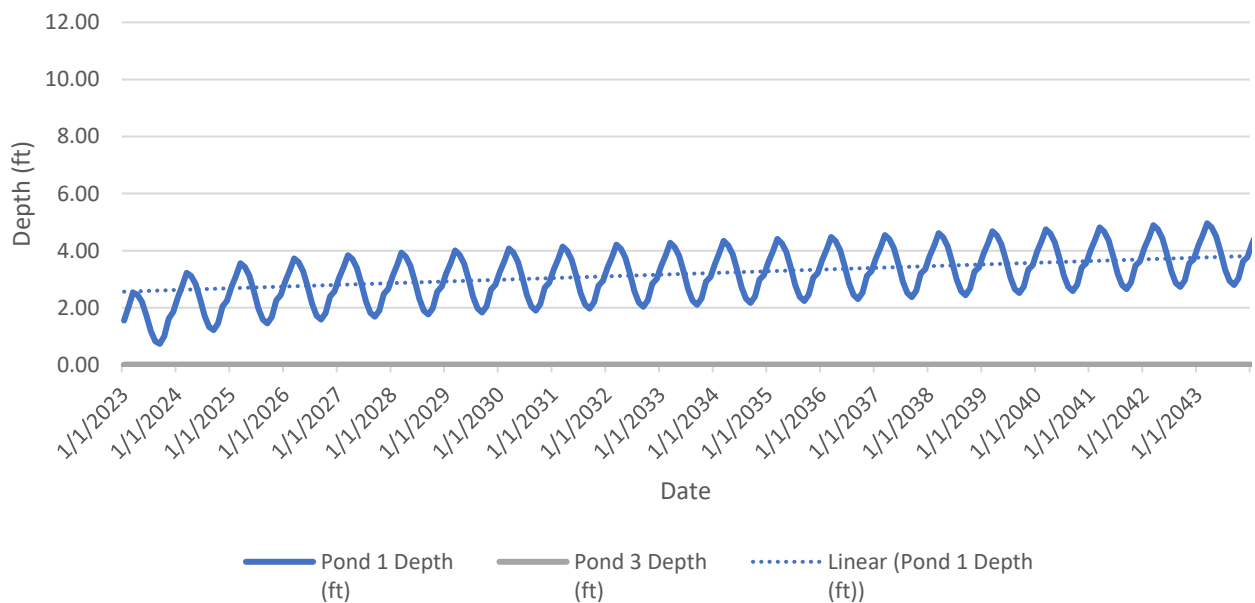


Figure 5-7 Graphical Depiction Lagoon Working as One

5.5.3. SCENARIO 3: REHABILITATE AND SPLIT 1 POND

This scenario shows one pond being rehabilitated and then the other pond being divided into two equal sized ponds. Assumptions were made that one acre would be used to form the inner dike area. In this scenario used a hydraulic conductivity of 6×10^{-7} cm/s was used. Figure 5-8 below shows the bigger pond will fill by 2025 at which point a smaller pond will need to be utilized. The third pond will then need to be put into place by 2043.

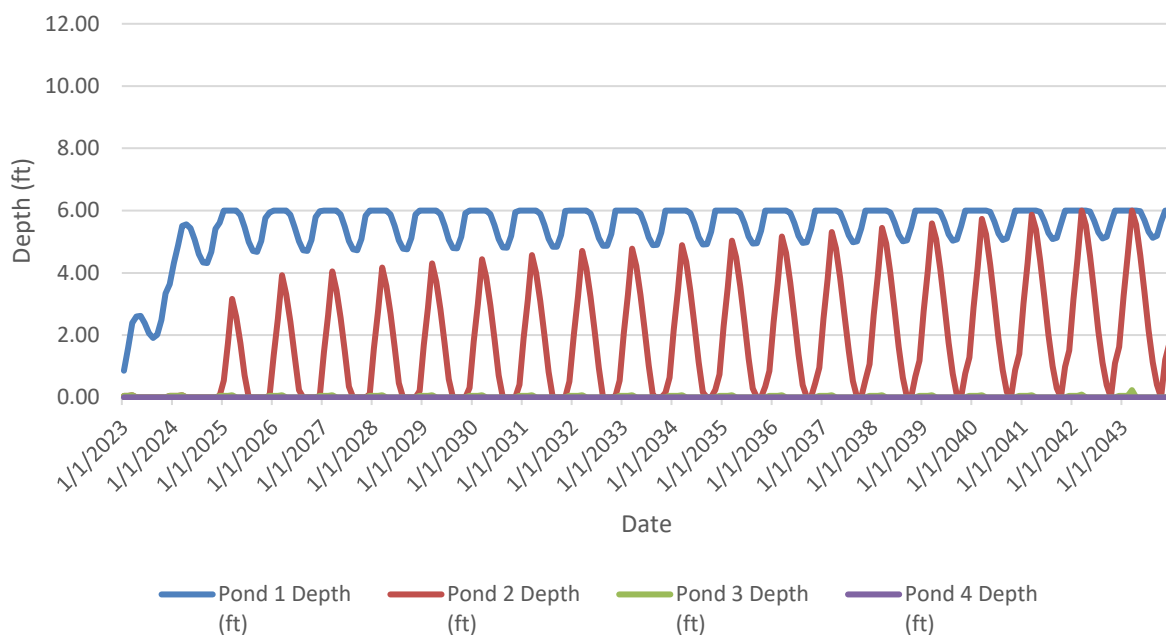


Figure 5-8 Rehabilitate Pond 1 and Divide Pond 2

Figure 5-9, below, shows pond 1 and 2 working together having a combined area of 9.97 acres and pond 3 being used as an overflow. This option is a possibility however the average depth is slightly above three feet for many years and an additional pond would need to be rehabilitated or put in place 20 years in the future.

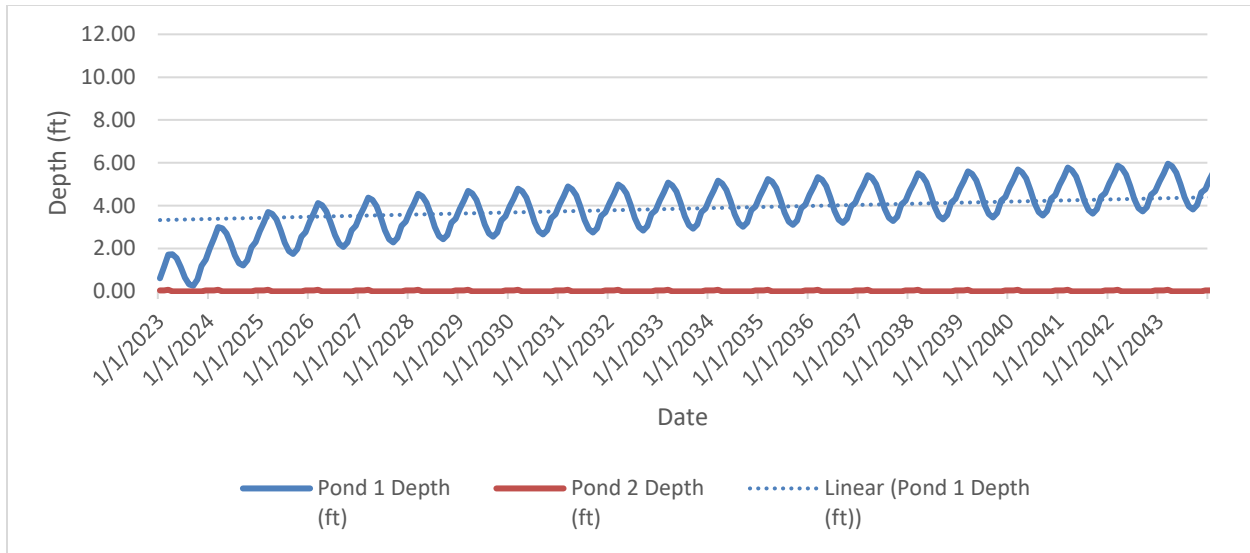


Figure 5-9 Rehabilitate Pond 1 and Divide Pond 2 Working Together

5.5.4. OTHER DESIGN CONSIDERATIONS

Other factors that influence the preliminary design could include:

- Prevent surface and groundwater contamination
- Minimizing the amount of earthwork needed to rehabilitate the existing lagoons
- Mitigate the hazards posed by future events such as additional bank armoring
- Use existing facilities and equipment where possible
- Maintain the same relative footprint of the lagoons/facility area
- Plan for long-term operation and maintenance

A design that follows these parameters will provide a safe, cost-effective solution for the wastewater treatment problems in Hinckley. In addition to these improvements, the flume structure should be replaced, and new equipment installed to better monitor and measure inflows. It may also be beneficial to video and clean some of the sewer pipes upstream from the flume structure to evaluate current conditions.

The rehabilitation project and improvements will be contained within the existing property, right of ways, and easements for the sewer system. Any disturbances identified in design that go beyond established property and easements will be accounted for and respective owners contacted to obtain easements as required.

5.5.5. ENVIRONMENTAL PERMITTING CONSIDERATIONS

Environmental permitting for the proposed improvements would be completed as part of the design of the recommended improvements.

5.6. LAGOON OPERATION

The proposed improvements would change the operations of the lagoons. Depending on the scenario chosen to use based on the above analysis the operation will likewise alter. Under normal operations of any typical lagoon system, the wastewater will flow into the primary cell through a gate from the flume structure. The wastewater can then flow through a transfer structure into a secondary cell #1 and the level of the primary cell can be controlled with a downward opening weir gate at the transfer structure. The wastewater then flows through a transfer structure into secondary cell #2 where the level of secondary cell #1 can be controlled by a downward opening weir gate at the transfer structure. Additional piping would be recommended to the secondary cell #1 to allow for flows to be diverted directly to secondary cell #1 if the primary cell needs to be offline for maintenance. This would allow for longer use of the system and easier operation and maintenance.

It should be noted that optimal lagoon depths are between three and six feet. Upon the primary cell filling to 6 feet this water should be split between the primary and secondary cells. Supplemental water may need to be added initially to maintain an average lagoon depth over three feet this is typical following draining and rehabilitation, until equilibrium is reached and a proper depth over three feet can be maintained without supplemental water added.

6. CONSTRUCTION RECOMMENDATIONS

6.1. CONSTRUCTABILITY SEQUENCING

The anticipated typical construction process is as follows:

1. Secondary Cell
 1. Remove interior and exterior riprap and stockpile as applicable.
 2. Remove sludge and sediment.
 3. Excavate and fill areas to meet subgrade.
 4. Place compacted embankment for new lagoon dike.
 5. Place liner, soil cover, and interior riprap.
 6. Install inlet and transfer structures as applicable.
 7. Install inlet and piping.
 8. Install exterior riprap armoring.
2. Primary Cell
 1. Remove interior and exterior riprap and stockpile as applicable.
 2. Remove sludge and sediment.
 3. Excavate and fill areas to meet subgrade.
 4. Place compacted embankment and raise height of exterior dike.
 5. Install new flume structure.
 6. Install inlet and piping.
 7. Install exterior riprap armoring as applicable.
 8. Repair fencing and install new fencing.

6.2. DESIGN-ASSIST

The construction of a sewer lagoon system consists of a large amount of earthwork and careful placement of the clay liner. These project elements require a contractor with the proper experience and history of acceptable performance to construct the lagoons properly. To help ensure the proper design and construction of the lagoons, it is highly recommended that a contractor be pre-selected during the initial design process for a design-assist style project.

Design-assist projects have several benefits. For this project, the contractor can work with the engineer to identify potential borrow areas for imported material needed to construct the dikes and clay liner. The contractor can also build test pads to help the engineer analyze and determine the proper clay liner materials for the clay liner hydraulic conductivity.

Another benefit of design-assist is that the contractor can give bid prices during design and help identify cost-effective solutions during the design process. These benefits help to reduce construction costs by minimizing the occurrence of costly change orders that tend to occur with lowest bid contracts.

7. COST EFFECTIVE ANALYSIS

7.1. NO ACTION/ REPAIR WITHOUT UPGRADE

No action or repair without upgrade is deemed nonviable, primarily due to the significant disparity between the state standard hydraulic conductivity of 1×10^{-6} cm/s and the back-calculated hydraulic conductivity of 4.03×10^{-6} cm/s, representing 403% increase above the state standard.

Repairing the existing ponds without changing the pond size is nonviable due to one pond running dry every year. Running a pond dry will negatively affect the pond operations and drastically shorten the reliability and life cycle of the pond.

7.2. LAGOON RECONSTRUCTION

Lagoon reconstruction will promote longevity, ease of use, and meet State compliance. The lagoon upgrades proposed are to be put in place of the existing lagoons due to their present damaged state. These upgrades include maintaining the current lagoon system footprint or reducing it in size. The proposed lagoon upgrade will include 3 lagoons that meet the State's hydraulic conductivity as well as provide the Hinckley with a more manageable smaller pond lagoon system and reduce the need to offset sewer flows by adding irrigation water into the system. The lagoons reconstruction proposed include 3 equally sized ponds or rehabilitation and splitting of the existing system. Both of which are viable options and will meet the needs of the community for years to come.

7.3. DISCHARGE MBR

The adoption of a Membrane Bioreactor (MBR) approach was looked at and deemed infeasible due to several significant factors. Firstly, the upfront cost associated with the installation and setup of the MBR system would be considerably high at \$5,757,000. Moreover, the long-term expenses related to employing full-time operators and obtaining necessary certifications would impose an additional financial burden on the town. A MBR facility cost estimate is shown in Appendix C.

Furthermore, the MBR facility would require substantial property allocation, making it impractical considering the current circumstances. Even with the implementation of an MBR system. Operation and maintenance of a facility like this would require additional personnel and training and would present a burden on the citizens of the community.

Given these considerations, it is evident that the lagoon upgrades proposal is a more viable and economically sound solution for Hinckley, offering a practical and effective means to address current and future wastewater management needs.

7.4. ENGINEER'S OPINION OF PROBABLE COST

An opinion of probable cost was prepared for both viable solutions in this preliminary design.

- The total probable construction cost for the three smaller ponds is approximately \$1,745,000.00 with a total project cost including professional services of \$2,076,600.00.
- The total probable construction cost for the two smaller ponds is approximately \$1,541,000.00 with a total project cost including professional services of \$1,850,600.00.

The engineer's opinion of probable cost is included in Appendix C. Due to the low population, and lack of capital available to the district, the only feasible project was determined to be a lagoon rehabilitation as mechanical treatment, and other treatment options would be cost-prohibitively expensive to Hinckley and its residents. After the lagoon rehabilitation is completed, it is recommended that the town complete a user rate and impact fee analysis to ensure the economic feasibility of the system. After the user rate and impact fee analysis is completed, budgets, user rates, and fees should be reviewed by the Town every two years to determine whether increases are required due to inflation, required system repairs, materials pricing, and labor costs.

8. IMPROVEMENTS AND IMPLEMENTATION

8.1. 0-5 YEARS

- The Siemens Mag Meter will need to be immediately repaired or replaced as the Town currently has no method of measuring or recording sewer flow due to 2021 storm.
- The most immediate need will be the redesign and reconstruction of the lagoon liners and optimization of the area for the current growth scenario. The compromised liner is costing the town precious water resources as well as putting undue stress on the lift stations by adding additional well water to the system to maintain surface water on the lagoons. The current mode of operation is inefficient and cannot be operated at the depth required by r317.
- The valve vault located near the terminal manhole should have a curb or retaining wall installed around it to protect it from the 100-year storm and ensure that it does fill with water during another major storm event. Doing so will protect the valves, piping, and metering equipment.
- The pipes described in the report sloped less than minimum slopes should be monitored for flow characteristics and video inspected to verify that solids are scoured out by existing flow conditions.
- A plan to phase out non vented manhole lids and scheduled pipe replacement plan should be implemented.
- Near the end of five years, this master plan should be reviewed and updated, especially regarding population growth to better understand the future demands that will be imposed on the system.
- A user rate/impact fee analysis is recommended for the town to set fair rates that will fund necessary maintenance, repairs, and expansion of the system.
- All manholes should be inspected to verify condition of concrete walls, flow characteristics, and trough condition. Record surcharging conditions if evident.
- A new manhole and 382 ft of pipe is planned along W 200 N Road to serve 3 R.V. stations.

8.2. 5-10 YEARS

- There are 69 potential residential septic systems that could be incorporated into the Town sewer system, See EX-1 in the appendix. Making plans to incorporate half of the most feasible of these connections could bring increased revenue to the sewer system as well as provide better collection and treatment for these residents when compared to septic.
- The Lift stations, pumps, meters and related equipment should undergo a professional inspection to determine remaining service life, repairs required, and replacements/upgrades available.
- This masterplan should be reviewed and updated to tailor the items to observed population growth/decrease.
- A video inspection of the sewer system should be completed to verify the condition and presence of corrosion to pipe system.
- All manholes should be inspected to verify condition of concrete walls, flow characteristics, and trough condition. Record surcharging conditions if evident.

8.3. 10-15 YEARS

- Additional septic systems identified in EX-1 not added in 5-10 years may be added to the system.
- 15 years from the time of this report the lift station equipment and pumps will have been continuously in service for 20 years. If not already replaced, these items will need to be evaluated and most likely replaced.
- All manholes should be inspected to verify condition of concrete walls, flow characteristics, and trough condition. Record surcharging conditions if evident.
- This masterplan should be reviewed and updated to tailor the items to observed population growth/decrease.

8.4. 15-20 YEARS

- A reevaluation of the redesigned and constructed lagoon system will be required as it approaches its twenty-year mark. The hydraulic conductivity of the liner, operational conditions, and depth should be carefully reviewed to ensure that everything is operating within the state code. It may be necessary to repair cells if the clay liner is failing and evaluate sludge depth.
- The Iron pipe may be undergoing significant corrosion as it will be approaching 50-60 years of continuous service during this period. Another video inspection of the pipe system will give understanding toward the condition of pipe and repairs required.
- It would be wise for the town to budget funds to repair compromised manholes and pipe sections during this period.
- Many items within the system are likely to be different or have experienced significant changes during this time. A renewed masterplan, system map, and GIS effort are recommended to

ensure that the town is provided the information required to operate the system within state rules.

- All manholes should be inspected to verify condition of concrete walls and trough. Observe surcharging conditions if evident.

8.5. 20-40 YEARS

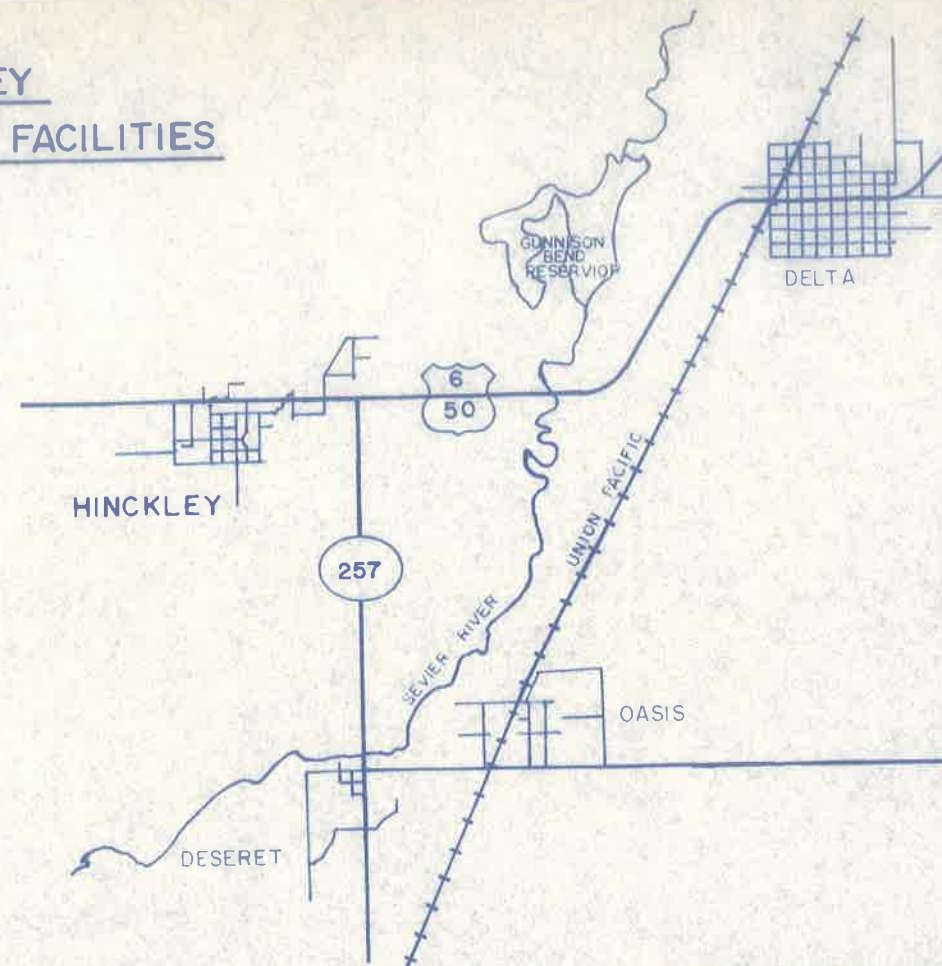
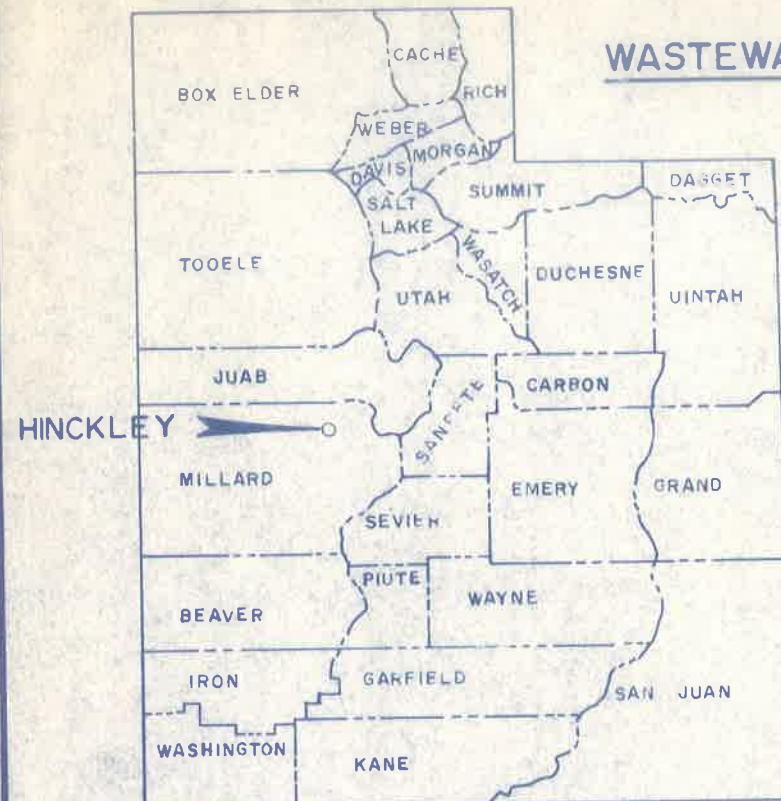
- The recommended approach from the updated master plan should be followed. The masterplan should be evaluated and reviewed every five years to ensure that population shifts, and system changes are accounted for and built into the masterplan. A new masterplan is not required every five years; however, the current masterplan should be amended to include pertinent updates to the system, demographics, and functionality.
- The lagoon system and liner will probably require additional cells or a significant overhaul of the clay liner at this time. The Town should budget sufficient funding as part of their user rate and impact fee analysis to carry out the requisite upgrades and repairs to the lagoon system at this time. With proper care and maintenance, it is possible to extend the life of the rehabilitated lagoon system up to 40 years.
- It is anticipated that corrosion and concrete deterioration due to hydrogen sulfide gas will have caused significant deterioration of the existing manhole and piping structures. Careful evaluation of this infrastructure should occur in detail every 5 years with compromised sections and manholes being upgraded to modern standards.
- The town should monitor the condition of manholes every 5 years and make note of required repairs.

9. CONCLUSION

In conclusion, the Hinckley wastewater system requires improvement. The collection system appears to be adequately sized to handle existing and future demands, but it is noted that a portion of the collection system has slopes lower than the current standard and should be monitored for sedimentation buildup. The wastewater total containment lagoons need repair and improvements. These improvements include removal of sediment and sludge, reconstruction of the clay liner, additional inlet controls, an additional dike to split the secondary cell depending on scenario chosen, and metering capabilities. With these improvements the wastewater system will meet the needs of the town for an estimated 40-year design period.

APPENDIX A. HINCKLEY SANITARY SEWER SYSTEM MAP SERIES

TOWN OF HINCKLEY WASTEWATER TREATMENT FACILITIES AREA MAPS



DRAWING CROSS REFERENCING

DETAIL LETTER
B
15
SHEET NUMBER
WHERE DETAIL IS
FOUND. (i.e. REFERS
TO DETAIL B ON
SHEET NO. 15)

INDICATES DETAIL
IS FOUND ON THE
SAME SHEET.

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

INDEX

GENERAL

Cover Sheet	-----	G-1
Area Maps, Index and Design Criteria	-----	G-2
Construction Note, Legend	-----	G-3
Plot Plan	-----	G-4

LAGOONS

Lagoons: Plan Layout	-----	L-1
Lagoons: Dike Detail	-----	L-2
Lagoons: Transfer Structures	-----	L-3
Lagoons: Pipe Profiles	-----	L-4, L-5
Lagoons: Estimated Quantities	-----	L-6
Lagoons: Cross Sections	-----	L-7, L-11

COLLECTION

Plan Profile	-----	C-1, C-25
--------------	-------	-----------

PUMP STATION AND TYPICAL DETAILS

Pump Station	-----	P-1, P-4
Typical Details	-----	T-1, T-6

DESIGN CRITERIA

I. EXISTING CONDITIONS

Population	(people)	525
Average Flow	(MGD)	0.042
B.O.D. Loading	(#/Day)	89

II. PROJECT CONDITIONS

Population	(people)	1,150
Average Flow	(MGD)	0.092
	(Ac.Ft./Yr.)	103.1
B.O.D. Loading	(#/Day)	196

III. UNIT SIZING

A. Total Containment Lagoons		
Number of Ponds		2
Total Mid depth surface Area		
(acres 2 @ 7.17 acres each		14.34
Depth	(feet)	6
Total Volume	(Ac/Ft)	86

Normal Annual Precipitation	(ft./yr.)	.59
Normal Annual Evaporation	(ft./yr.)	3.98
Seepage Losses	(ft./yr.)	3.80
Total Losses	(ft./yr.)	7.19
B.O.D. Loading on Pond 1	(#/acre/day)	27.3

B. Collection Pump Stations	North	South
Number of Pumps per Station	2	2
Individual Pump Capacity (GPM. each)	125	125
Total Dynamic Head (feet)	15	26
Individual Pump Horse Power	2	3

C. Main Pump Station		
Number of Pumps		2
Individual Pump Capacity (GPM. each)		250
Total Dynamic Head (feet)		25
Individual Pump Horse Power		3

D. Standby Generator		
Protoble	(KW rating)	12.5

TOWN OF HINCKLEY

WASTEWATER TREATMENT FACILITIES



CREAMER & NOBLE ENGINEERS

DESIGNED RSC	CHECKED ACR	DRAWN JLF	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

CONSTRUCTION NOTES

ALL PROFILE ELEVATIONS ARE SEWER INVERT.

STATIONS SHOWN ARE FOR CENTERLINE OF MANHOLE AND CLEANOUTS.

INSTALL SEWER LATERAL WHERE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

ALL SEWER LATERALS ARE 4" DIAMETER UNLESS OTHERWISE SPECIFIED.

ALL SEWER COLLECTION LINES ARE 8" DIAMETER UNLESS OTHERWISE SPECIFIED.

STATE HIGHWAY BACKFILL REQUIREMENTS SHALL BE IN EFFECT FOR ALL TRENCHES WITHIN HIGHWAY RIGHT-OF-WAY.

INSTALL WATER TIGHT PLUGS IN ALL STUBS OUT OF MANHOLES.

CONTRACTOR SHALL VERIFY EXACT LOCATION OF EXISTING UTILITIES ON EACH LINE PRIOR TO EXCAVATION.

ABBREVIATIONS

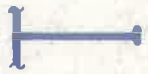
GENERAL			
EXIST.	EXISTING	TYP.	TYPICAL
STA.	STATION	ST. STL.	STAINLESS STEEL.
INV.	INVERT	I. D.	INSIDE DIAMETER
S	SLOPE	O. D.	OUTSIDE DIAMETER
SHT.	SHEET		

PIPE			
PVCP	POLYVINYL CHLORIDE	CMP	CORRUGATED METAL
CIP	CAST IRON	GSP	GALVANIZED STEEL
DIP	DUCTILE IRON	RCP	REINFORCED CONCRETE

STRUCTURES & DETAIL SHT. REFERENCE

MH	MANHOLE		DMH	DROP MANHOLE	
CO	CLEANOUT		FC	FIELD CLOSURE	
S/W	SEWER/WATER CROSSING				

LEGEND

INSTALL	
	SEWER PIPELINE 
	SEWER CONNECTION 
	{ MANHOLE DROP MANHOLE CLEANOUT
	

GENERAL	
	EXISTING GROUND
	SELECT FILL
	ROAD BASE
	ROCK BEDDING
	CONCRETE

EXISTING			
 S	SEWER LINE	 W	WATER LINE
 T	SEWER CONNECTION	 O	WATER SERVICE
 T	TELEPHONE LINE (UNDERGROUND)	 IR	IRRIGATION (PIPE, DITCH OR CULVERT)
 P	POWER LINE (UNDERGROUND)	 SD	STORM DRAIN
 x	FENCE	 X	WATER VALVE
 O	MANHOLE	 H	FIRE HYDRANT
 U	UNDERDRAIN	 ■	UNDERDRAIN MANHOLE

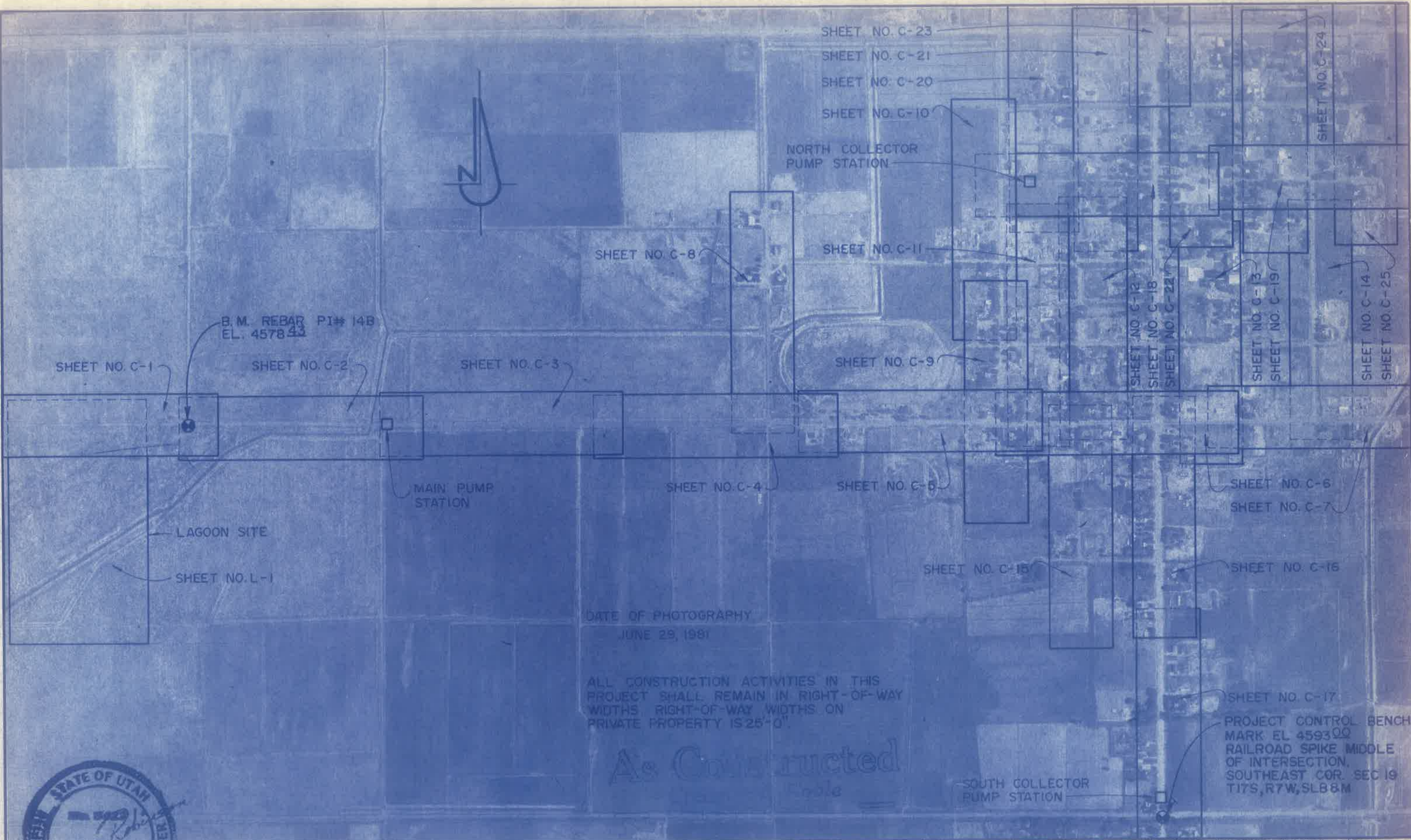


As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



DESIGNED TM	CHECKED ACR	DRAWN AKB	SCALE NONE
APPROVED	DATE 9/81	PROJECT NO.	



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

PLOT PLAN



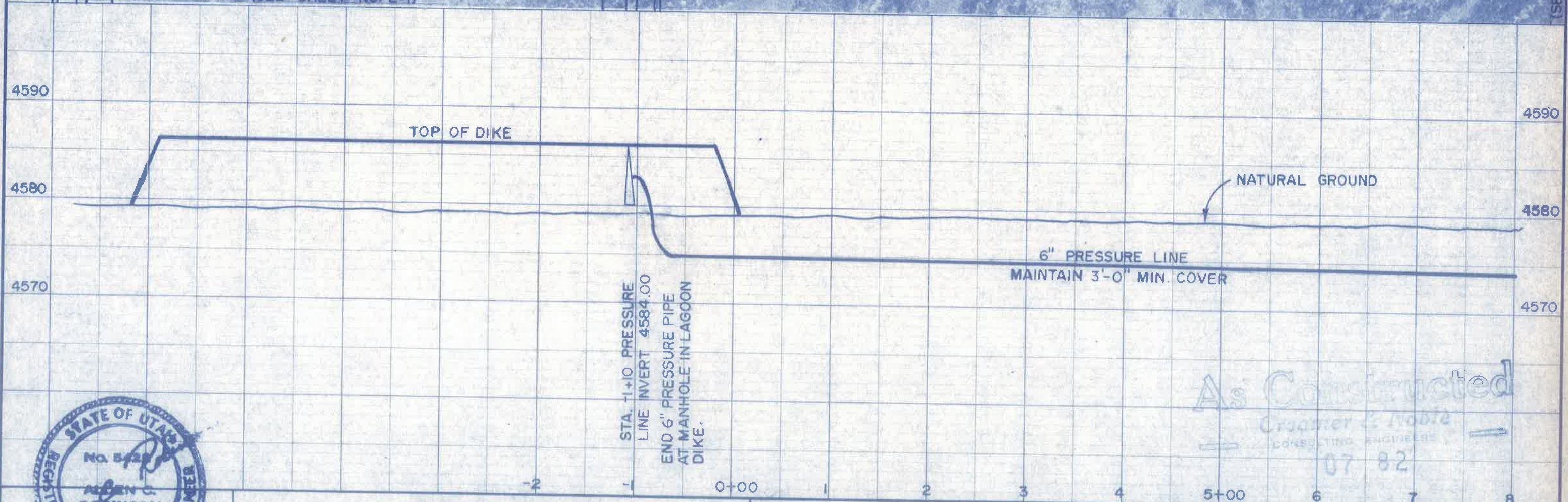
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1" = 500'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	
		G-4	

BM PI #14B
REBAR
ELEV. 4578.43

NOTE:
6" PRESSURE PIPE IS PAID FOR PER LIN. FT. BID PRICE.
MANHOLE AND LAGOONS WILL BE PAID FOR UNDER
LAGOON LUMP SUM BID PRICE.

(SEE SHEET NO. L-1)



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

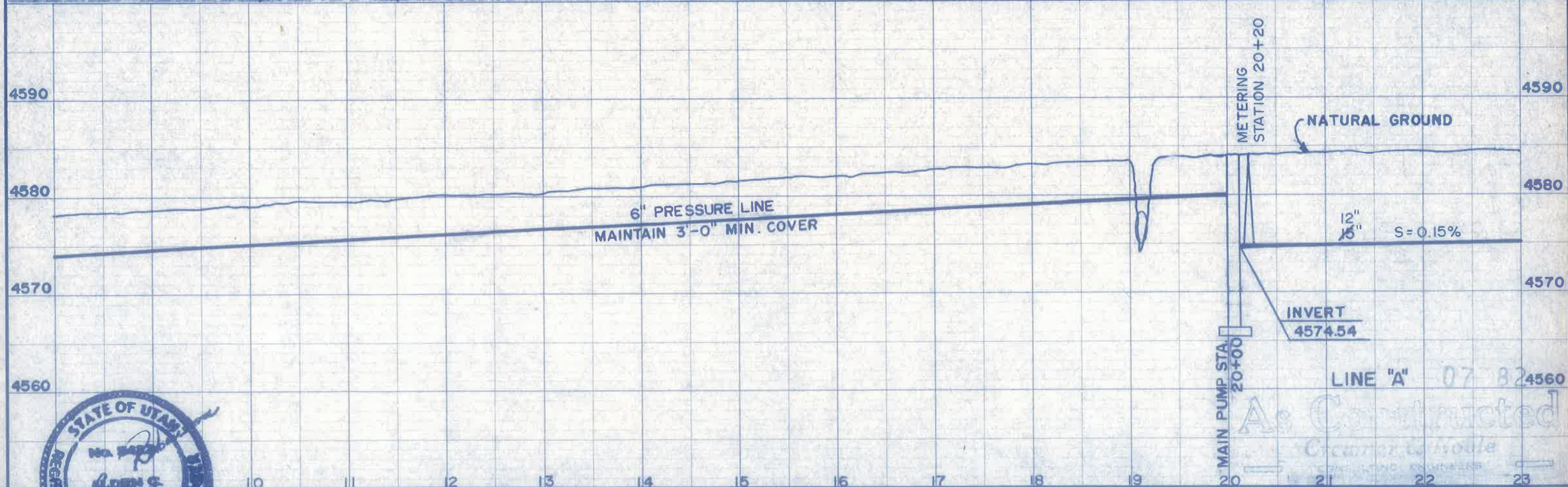
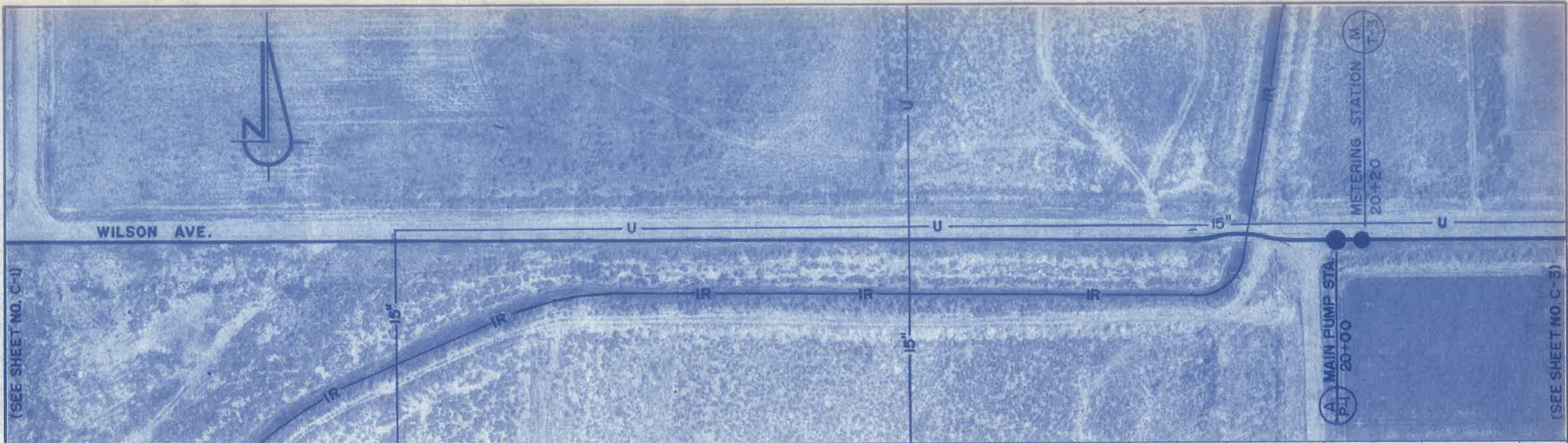
LINE "A"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

DESIGNED RSC	CHECKED ACR	DRAWN RH	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



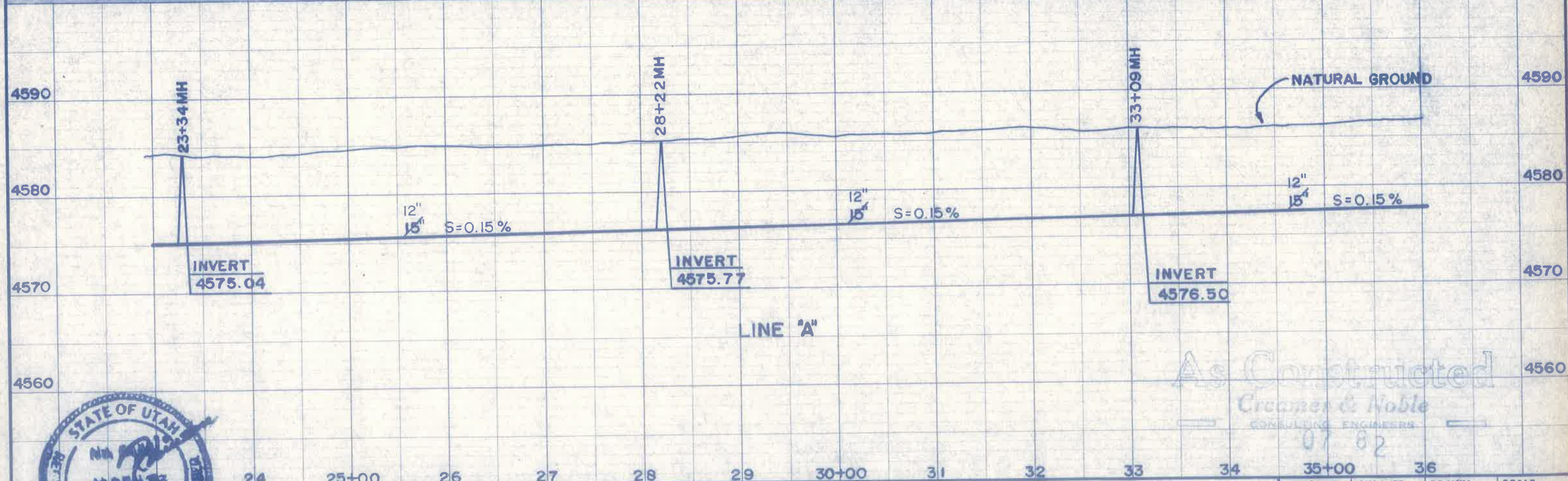
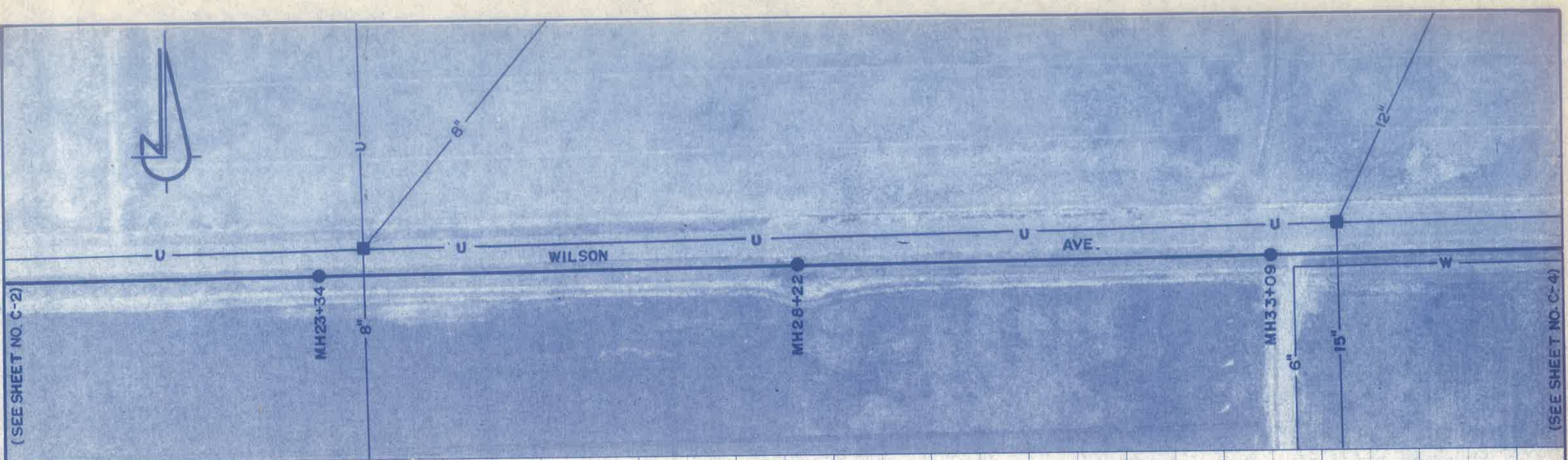
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "A"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JLTF	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-2	

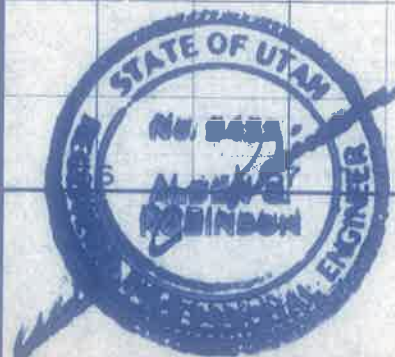
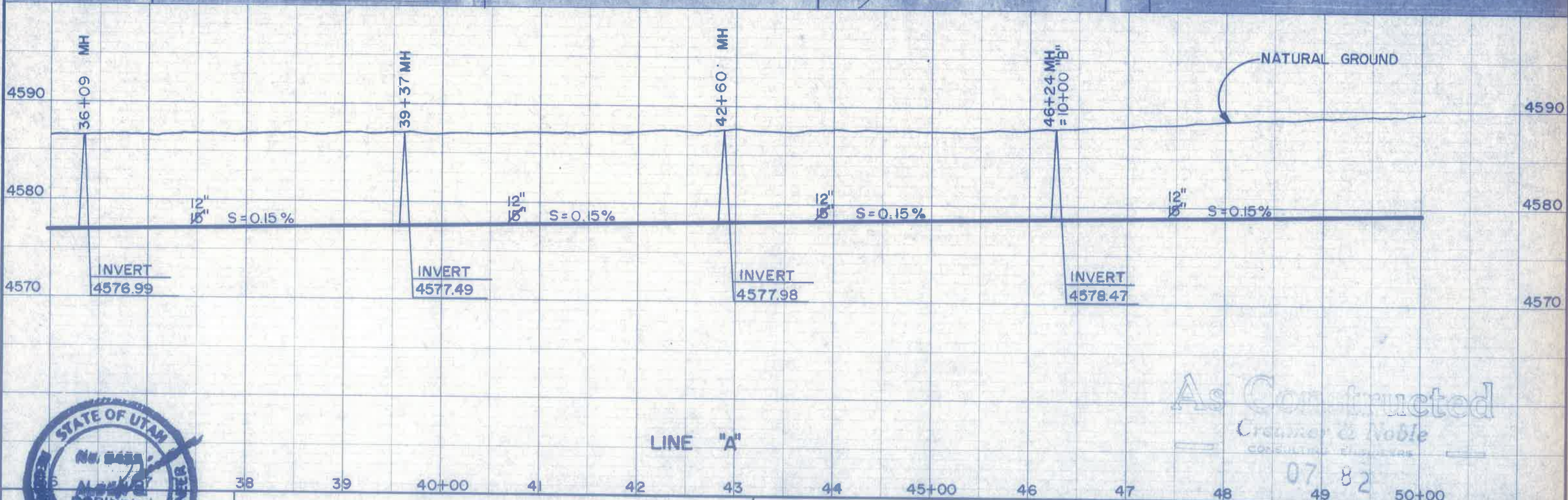


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

DESIGNED RSC	CHECKED ACR	DRAWN JLTF	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-3	



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

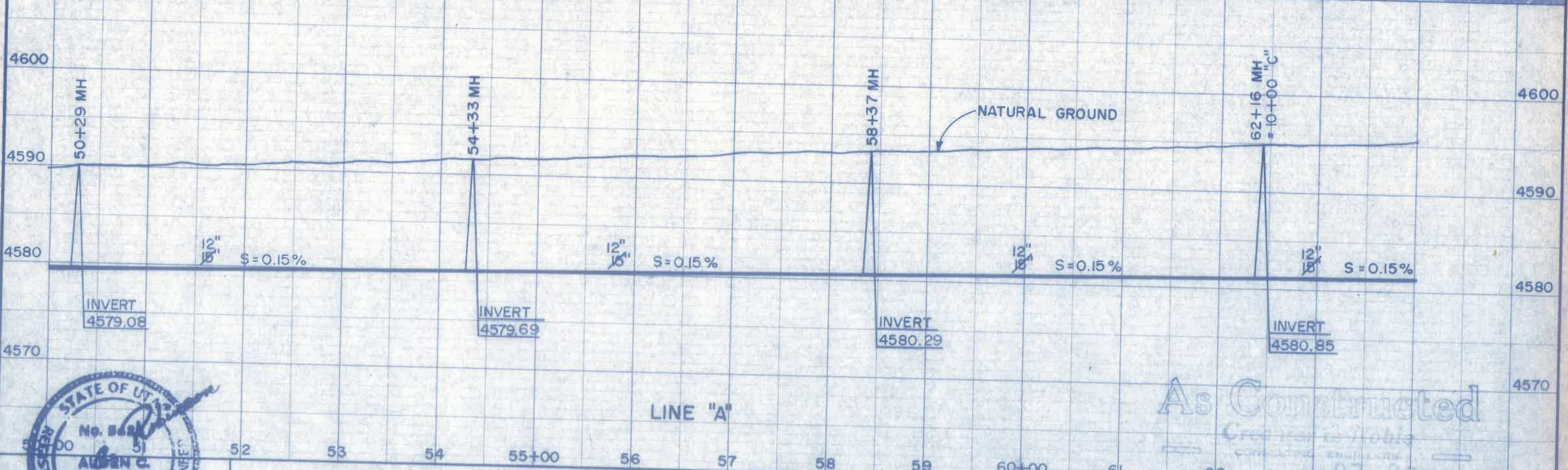
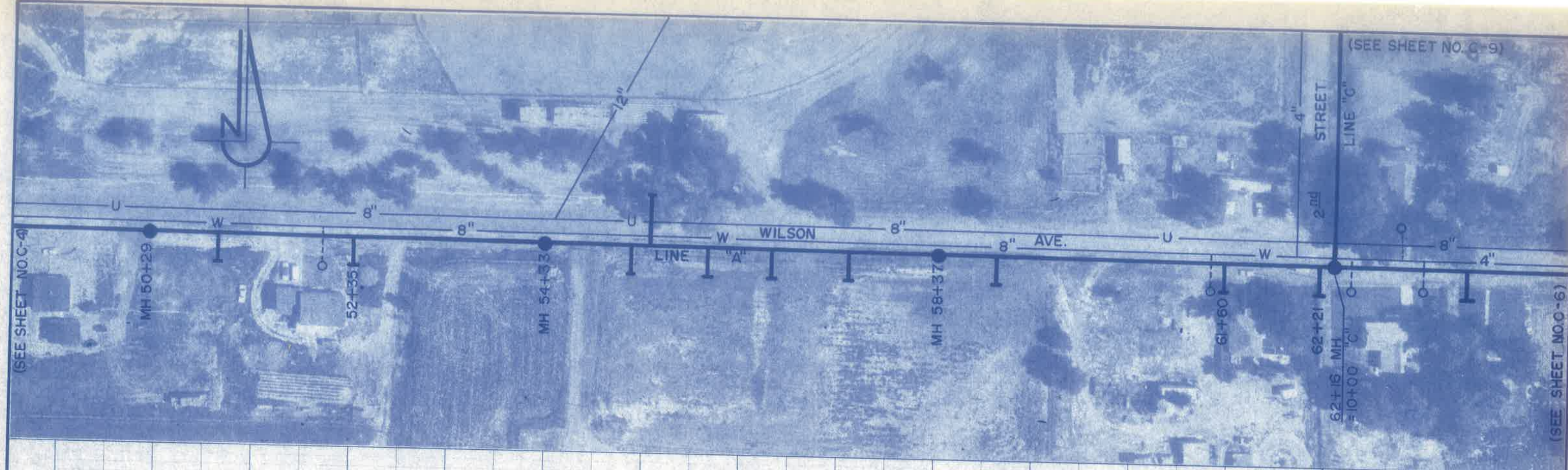
LINE "A"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

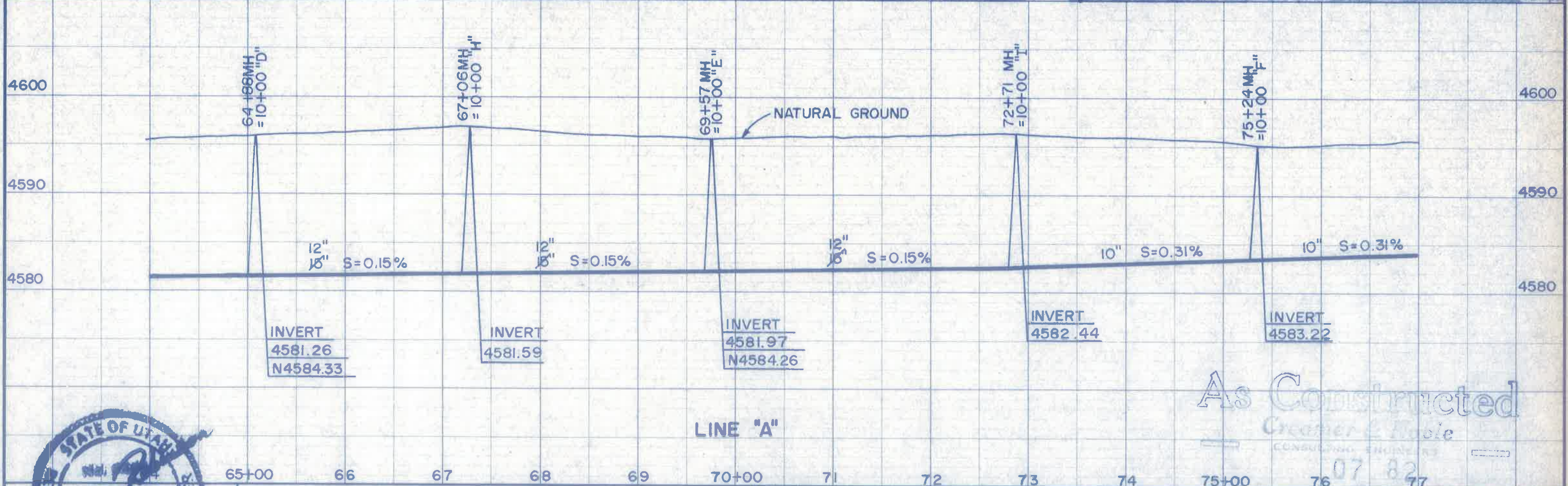
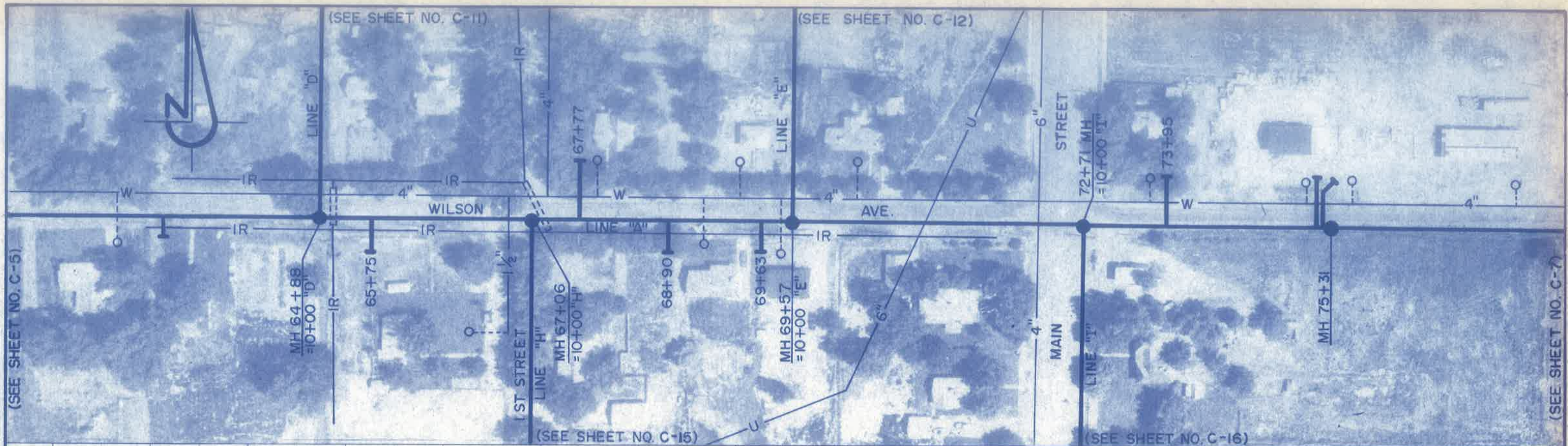
DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES
LINE "A"



DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

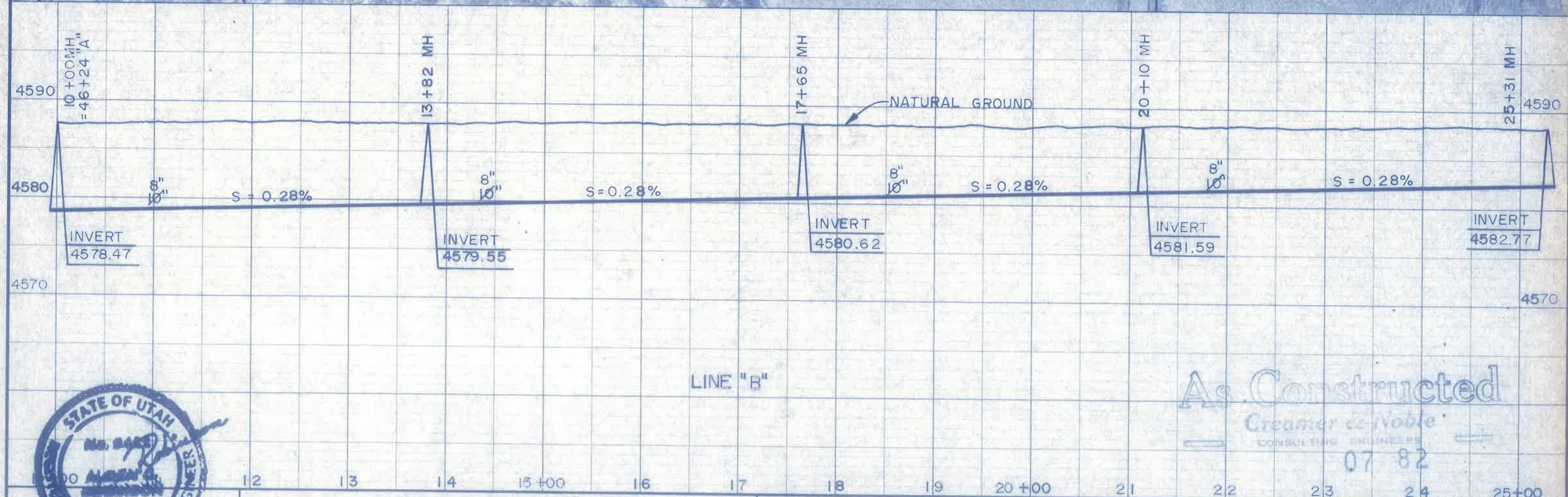
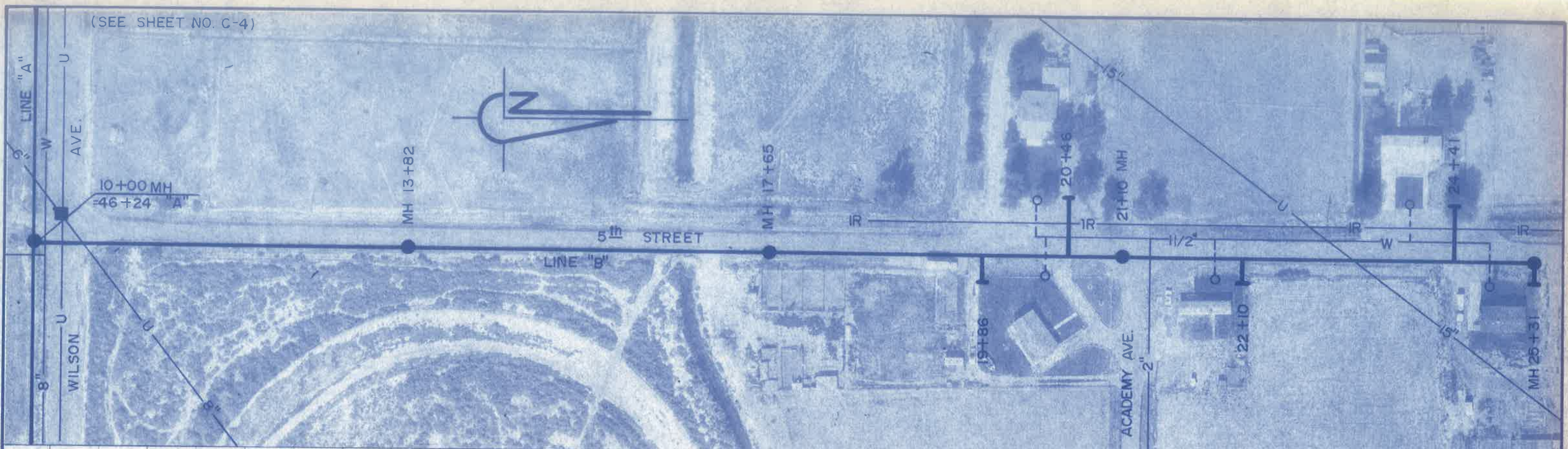


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

(SEE SHEET NO. C-4)

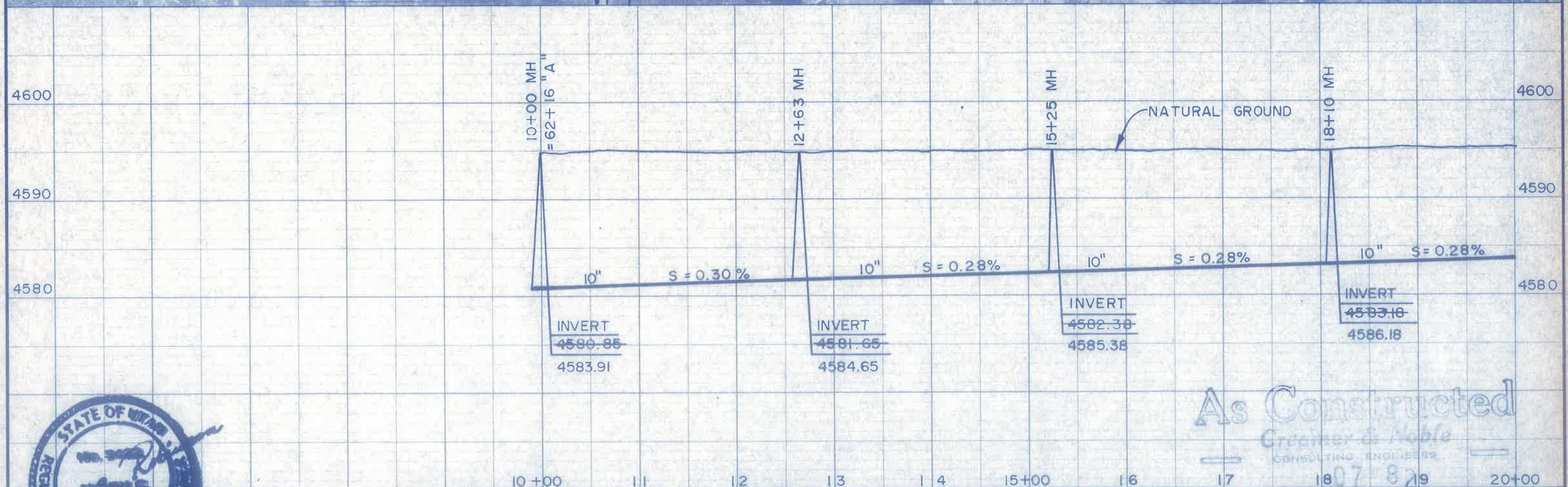
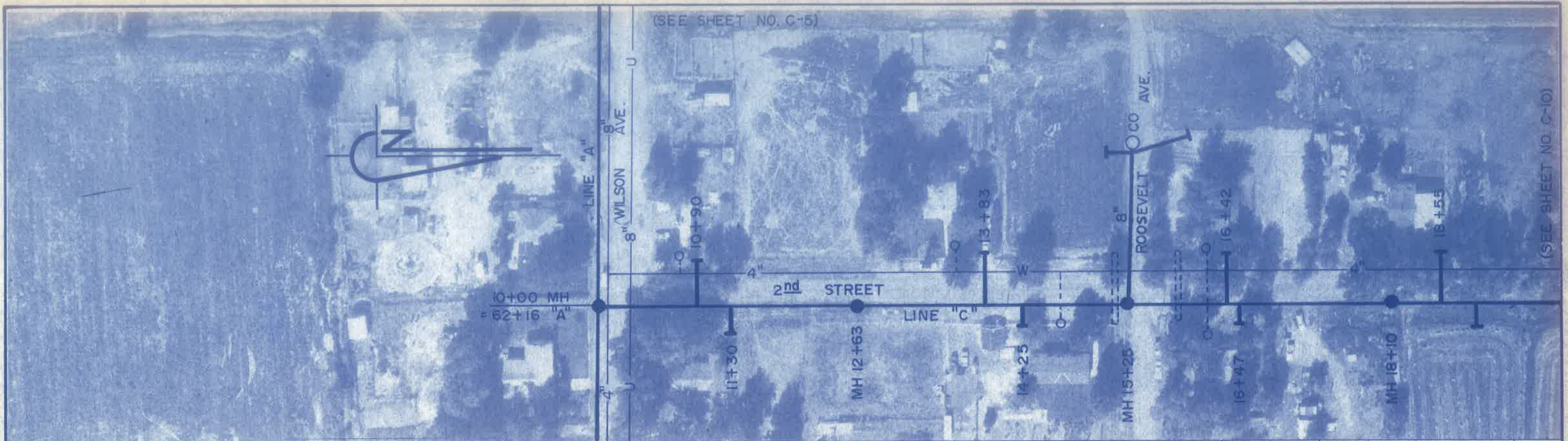


As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "C"



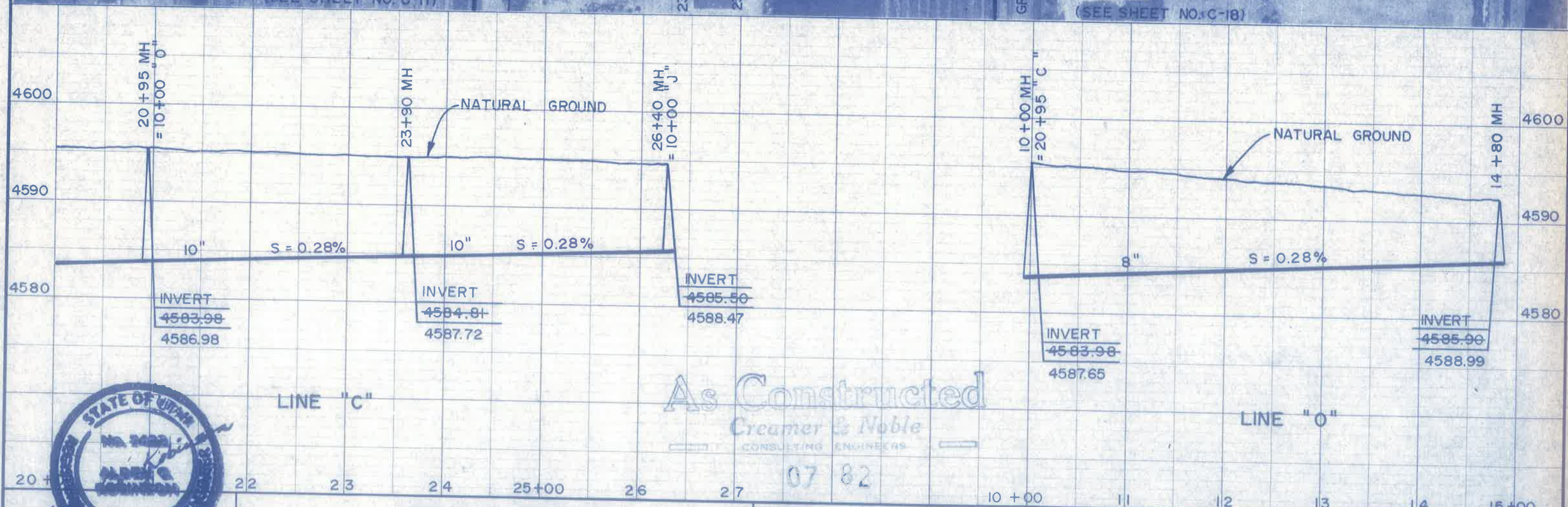
DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-9	

(SEE SHEET NO. C-9)



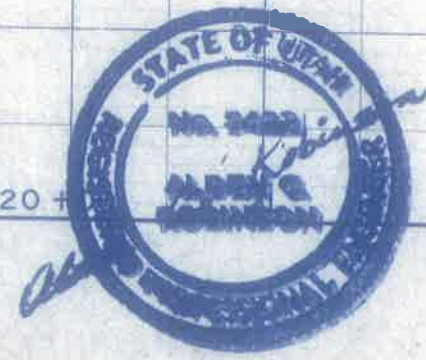
(SEE SHEET NO. C-11)

(SEE SHEET NO. C-18)



As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07 82



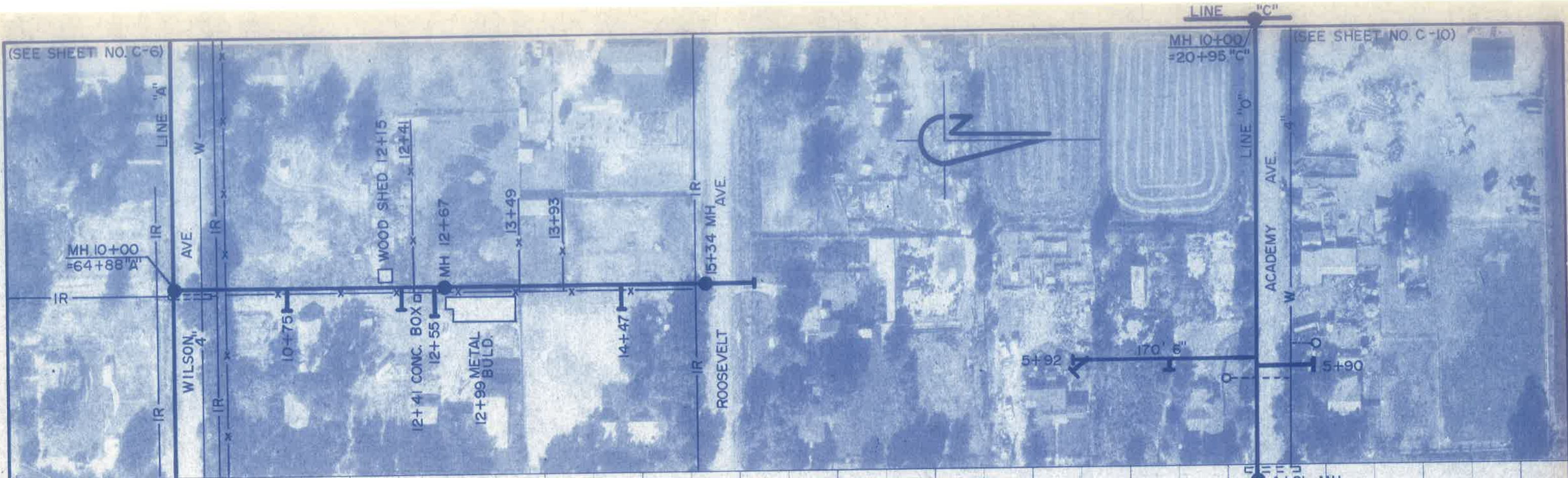
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "C" & LINE "O"

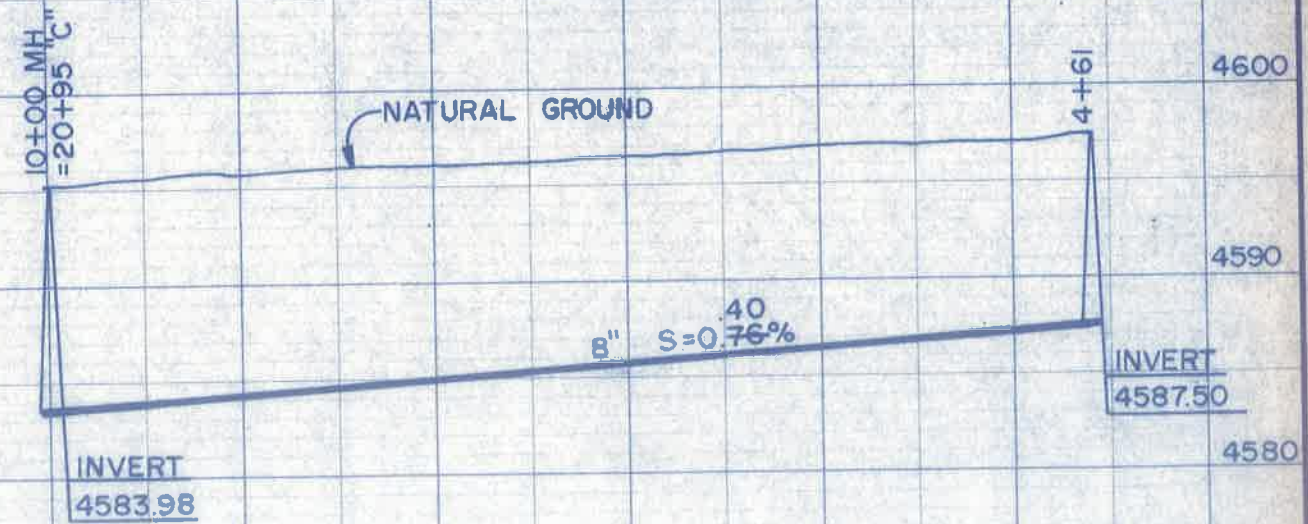
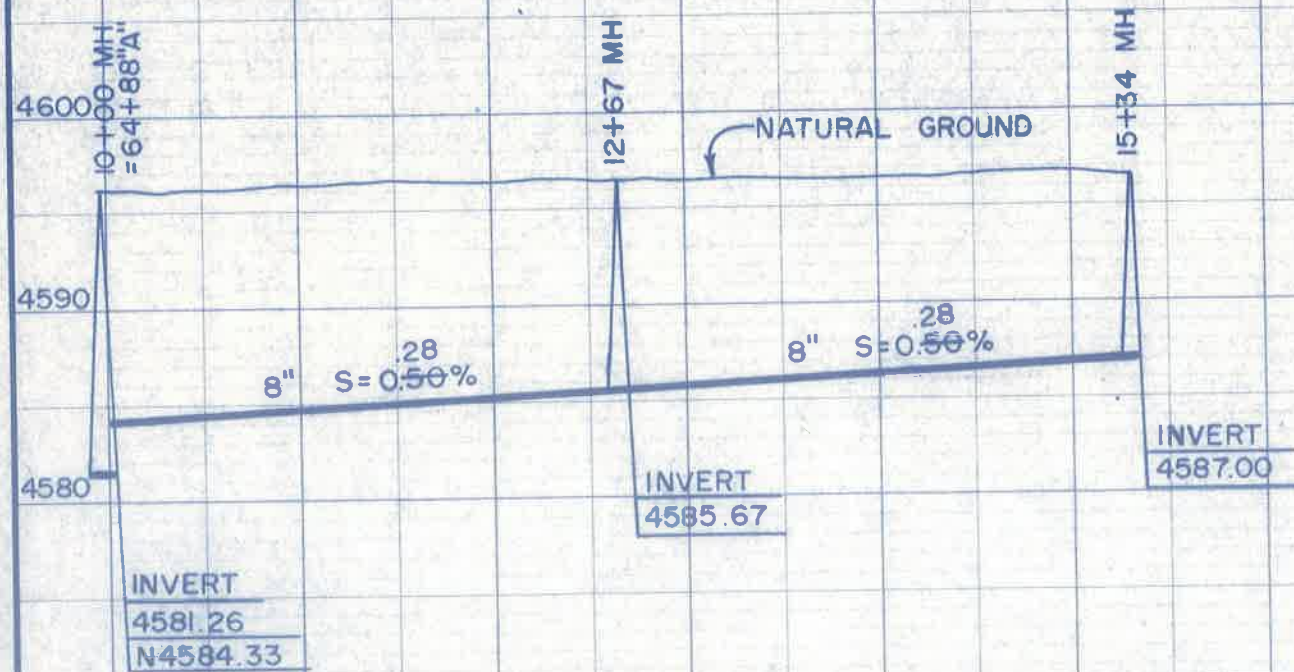
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

(SEE SHEET NO. C-6)



(SEE SHEET NO. C-10)



LINE "D"

LINE "O"

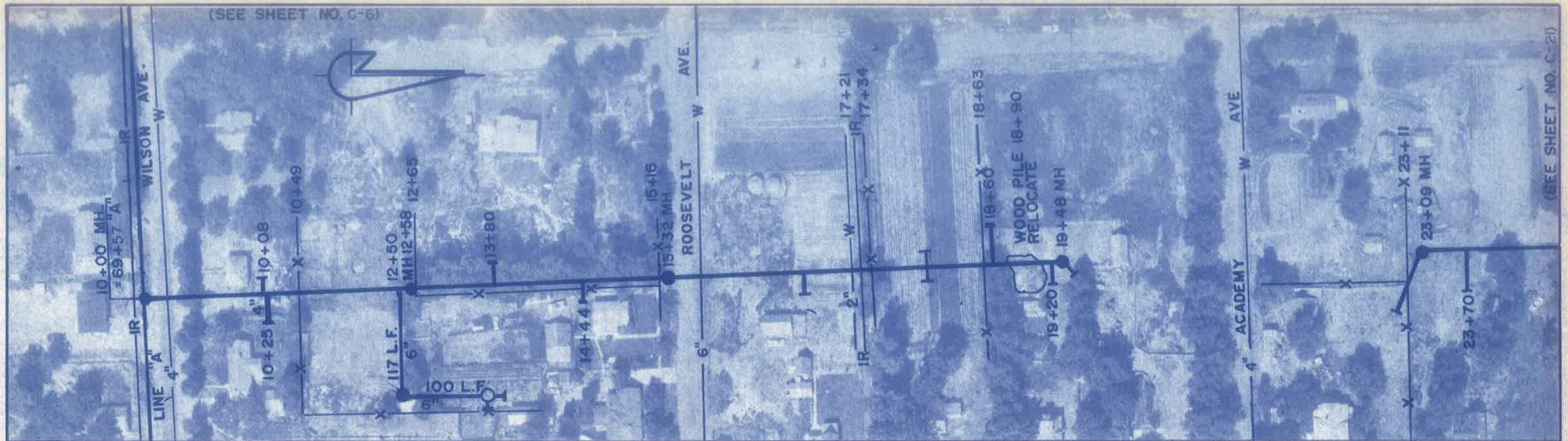
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

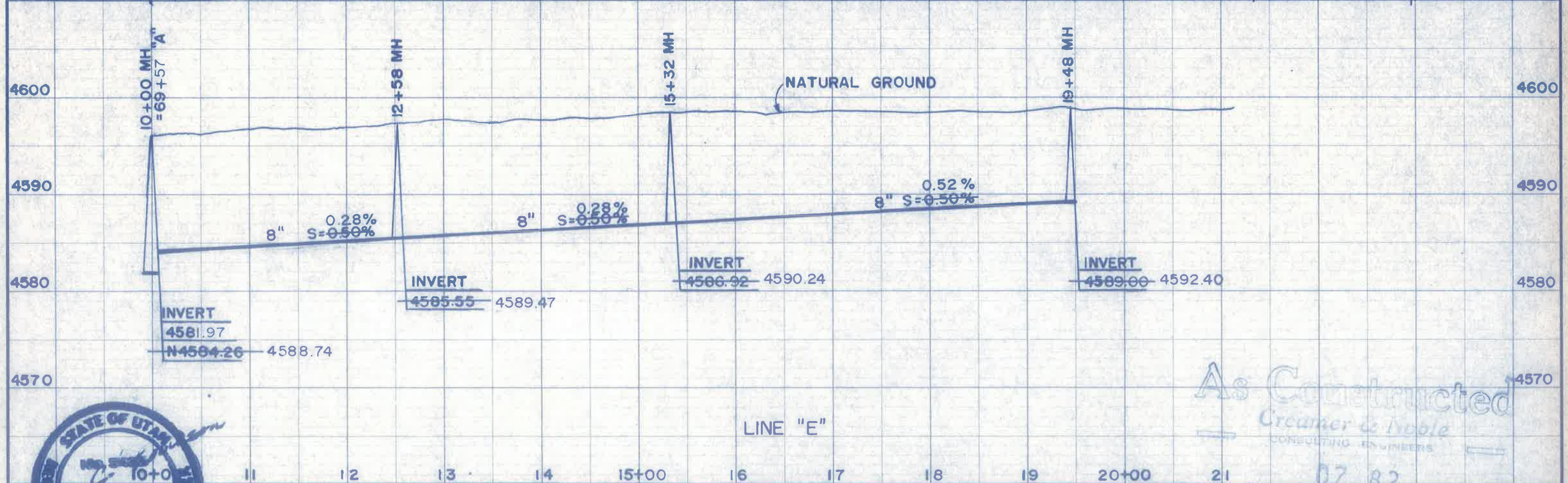
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN LOS	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-11	

(SEE SHEET NO. C-6)



(SEE SHEET NO. C-21)



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "E"

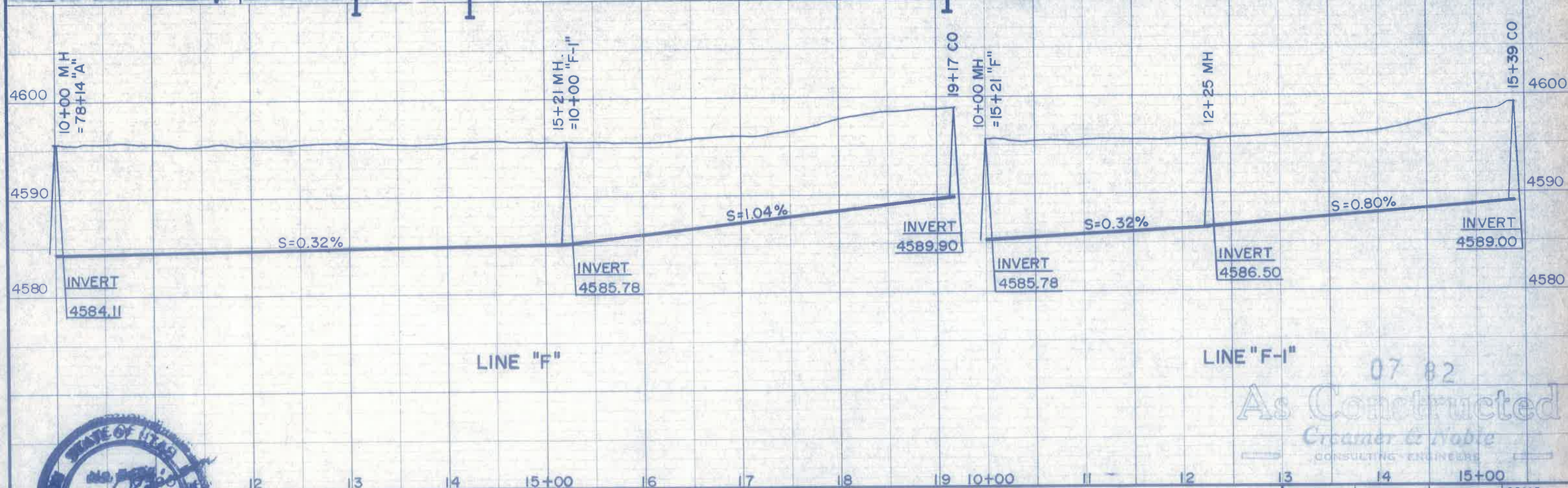
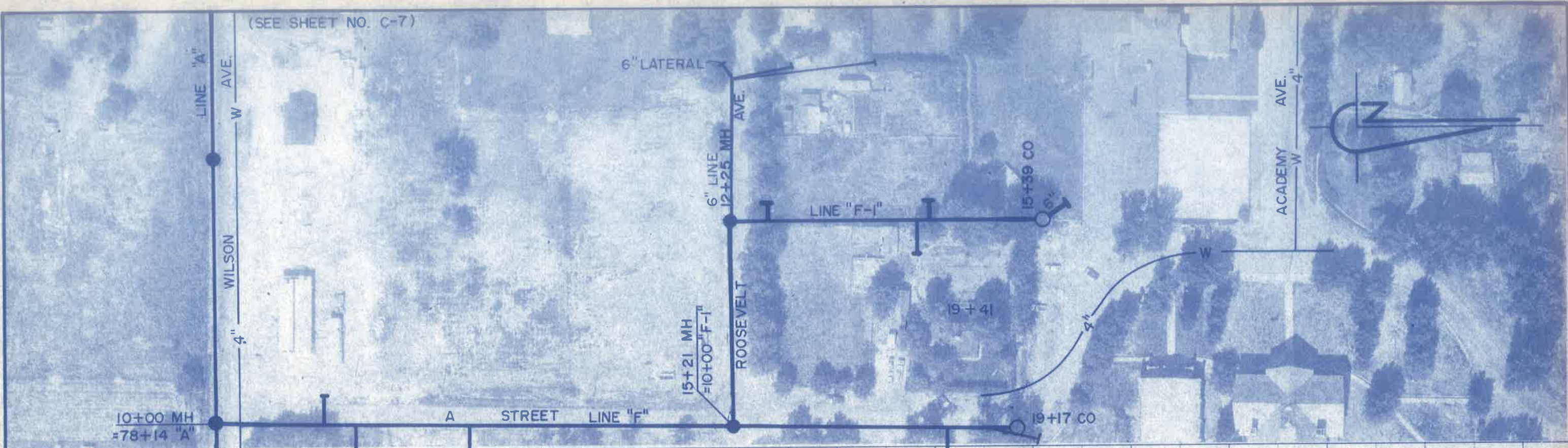


CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07.82

DESIGNED RSC	CHECKED ACR	DRAWN JLTF	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-12	

(SEE SHEET NO. C-7)



LINE "F"

LINE "F-1"

07 82

As Constructed
Creamer & Noble
CONSULTING ENGINEERS



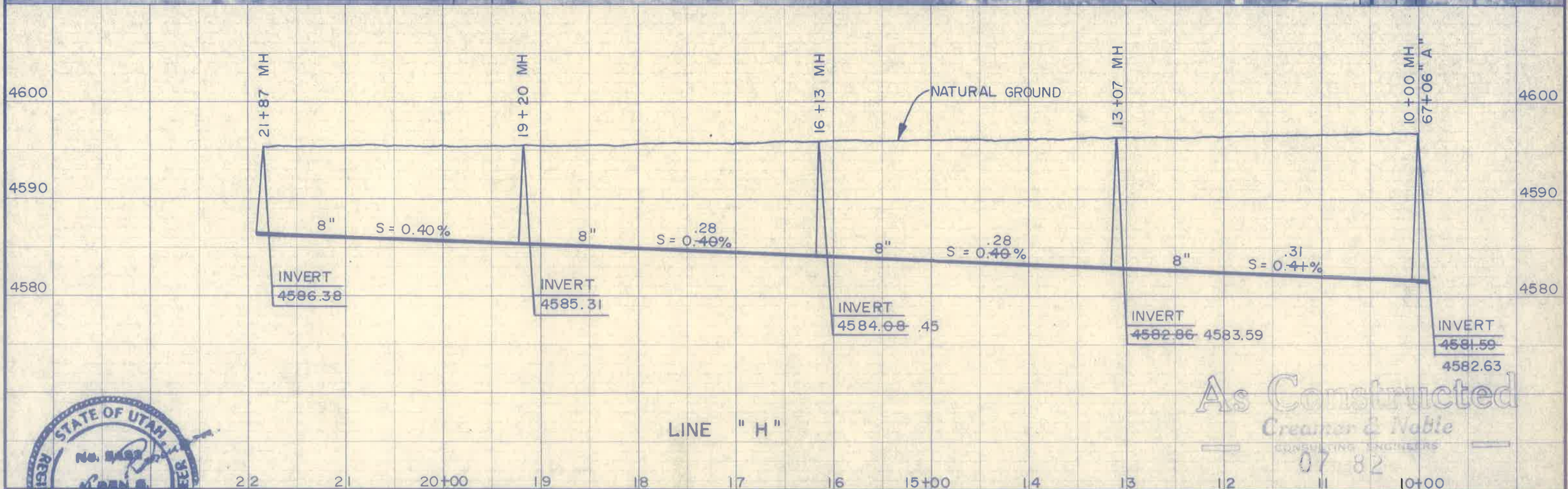
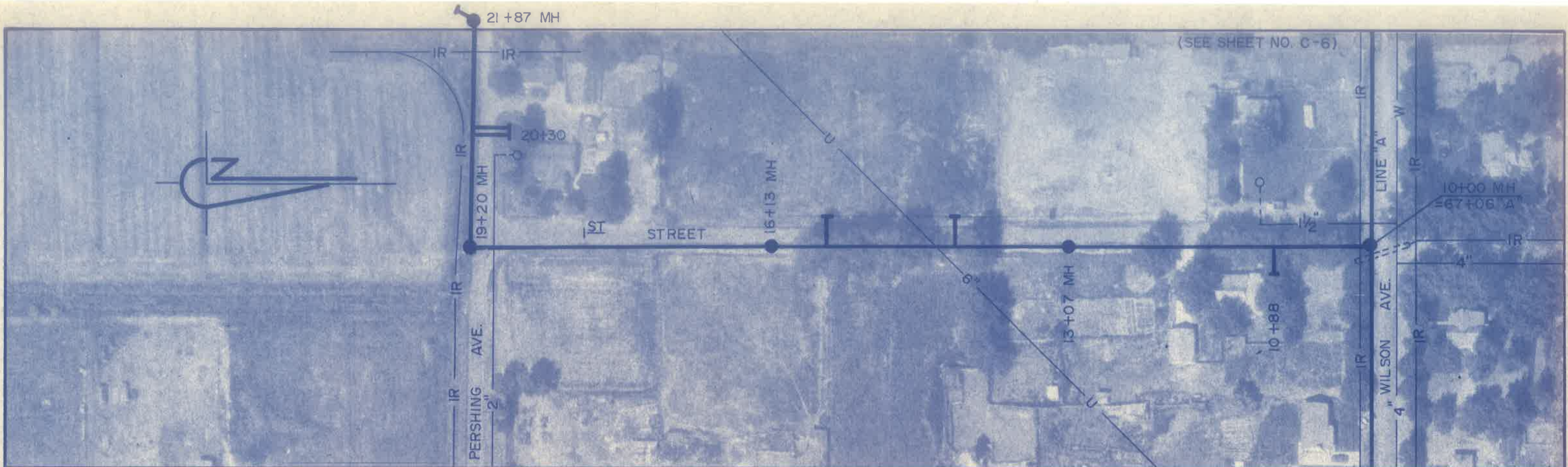
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "F"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-13	

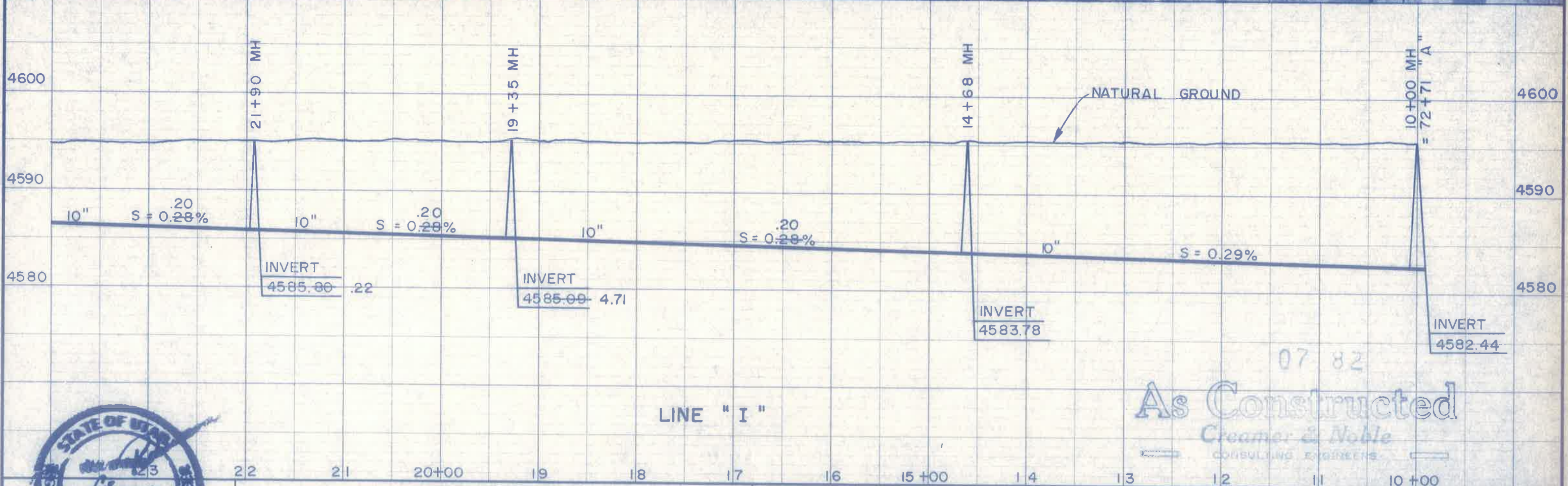
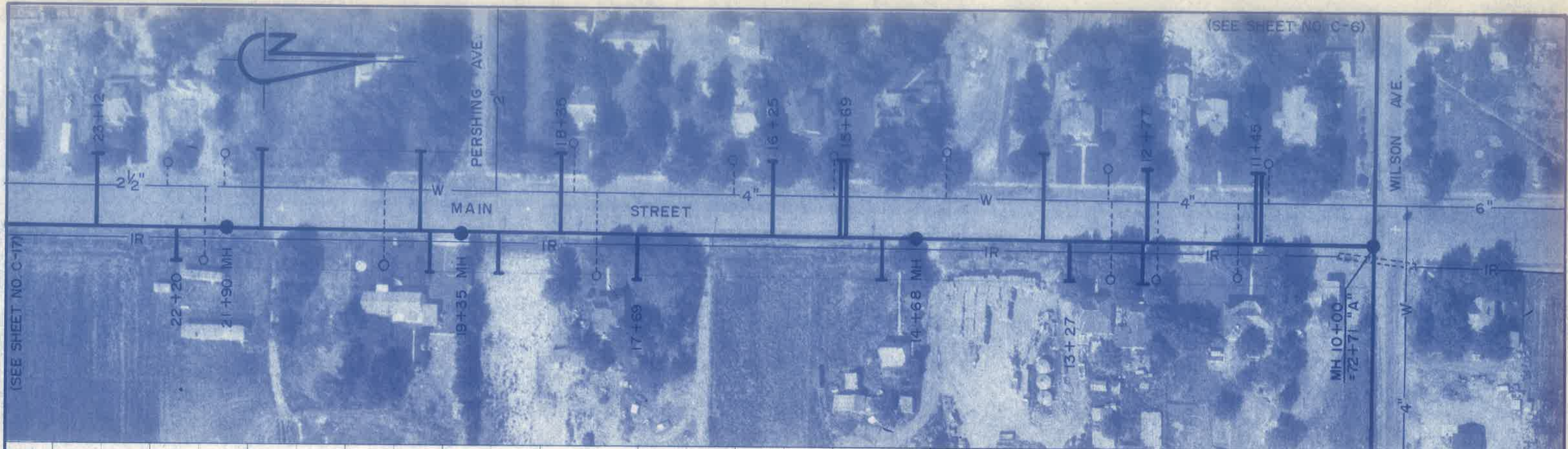


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



LINE "I"

07 82
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

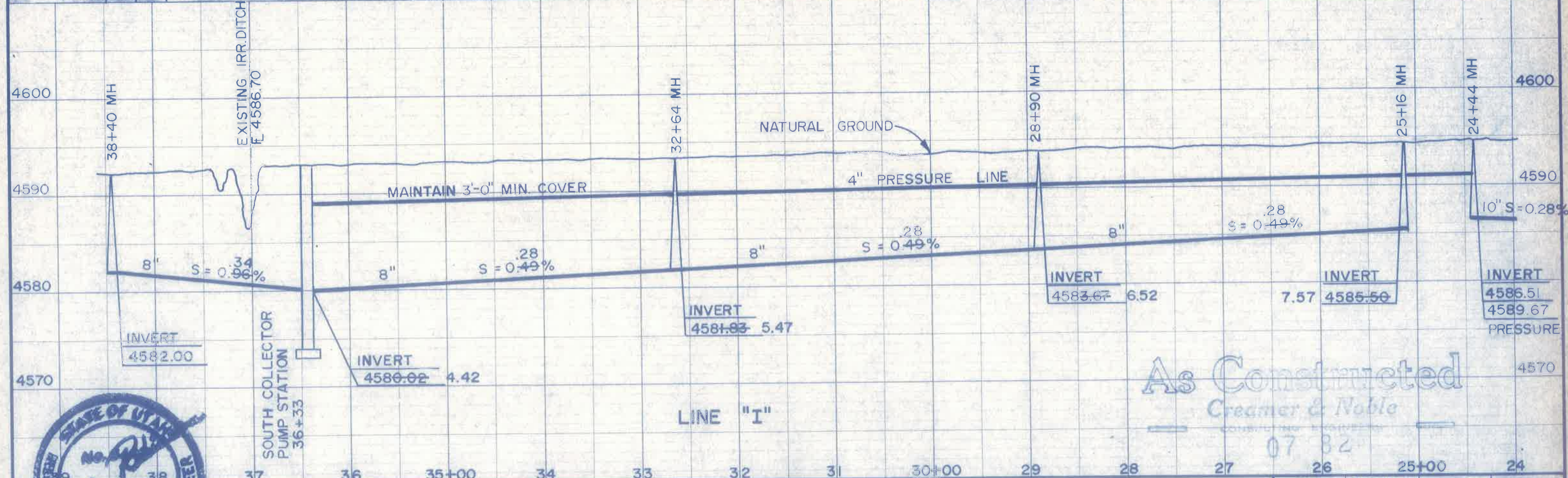
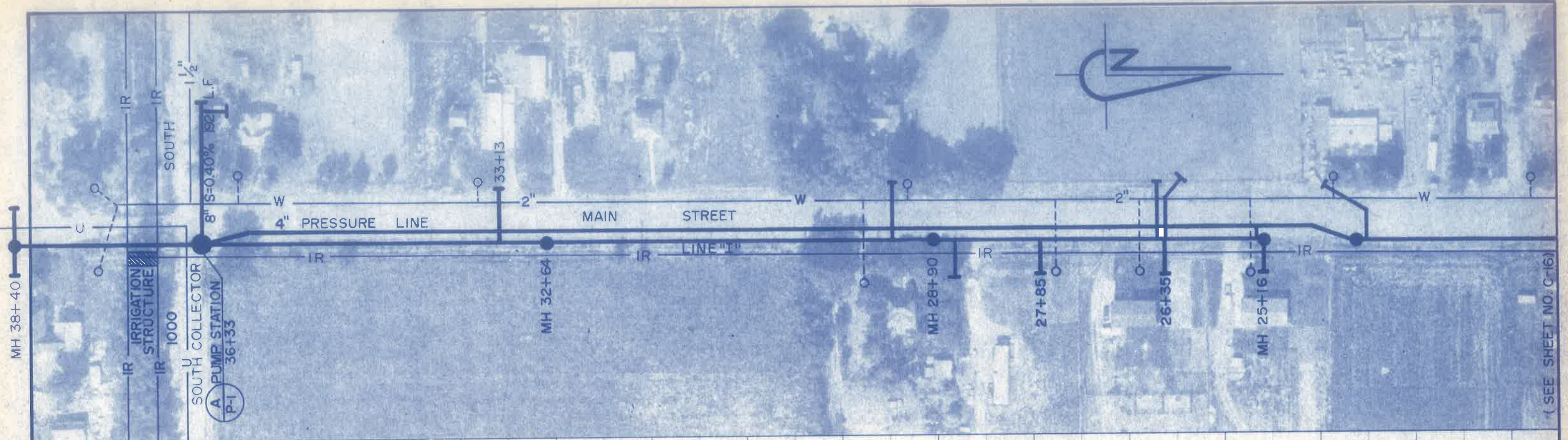


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "I"



DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-16	

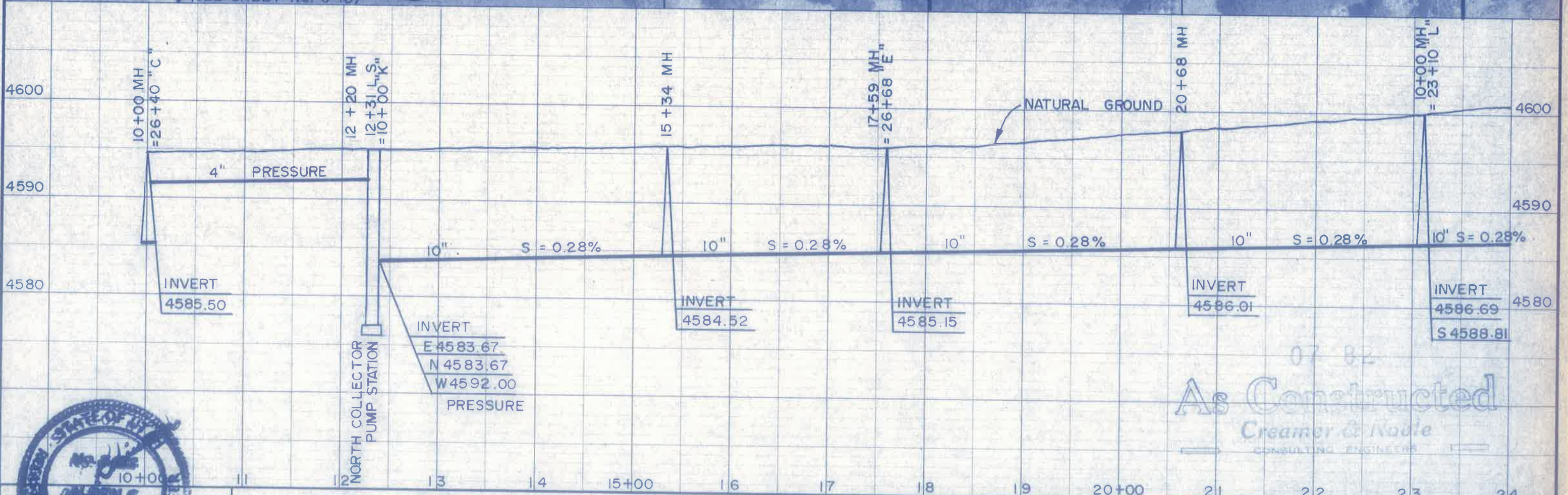
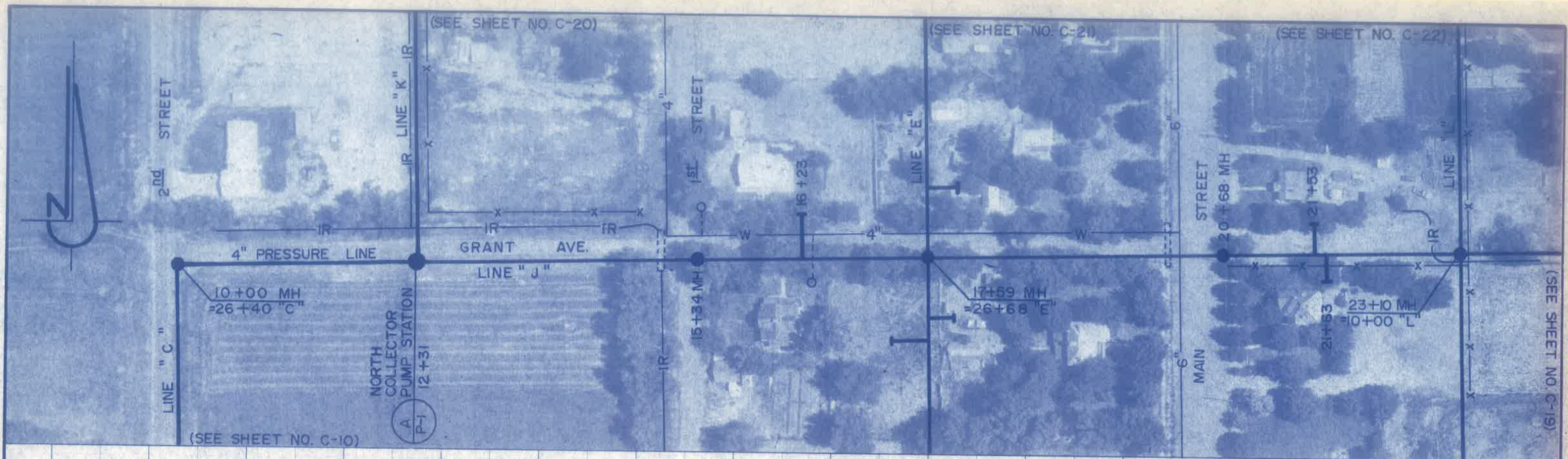


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	C-17

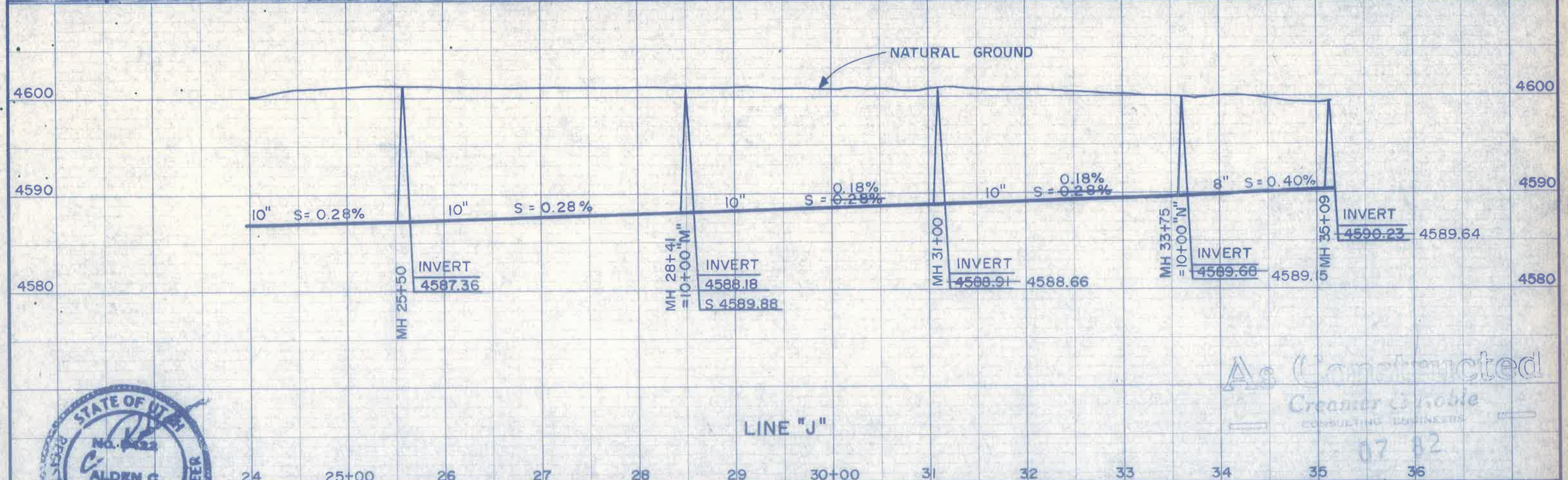
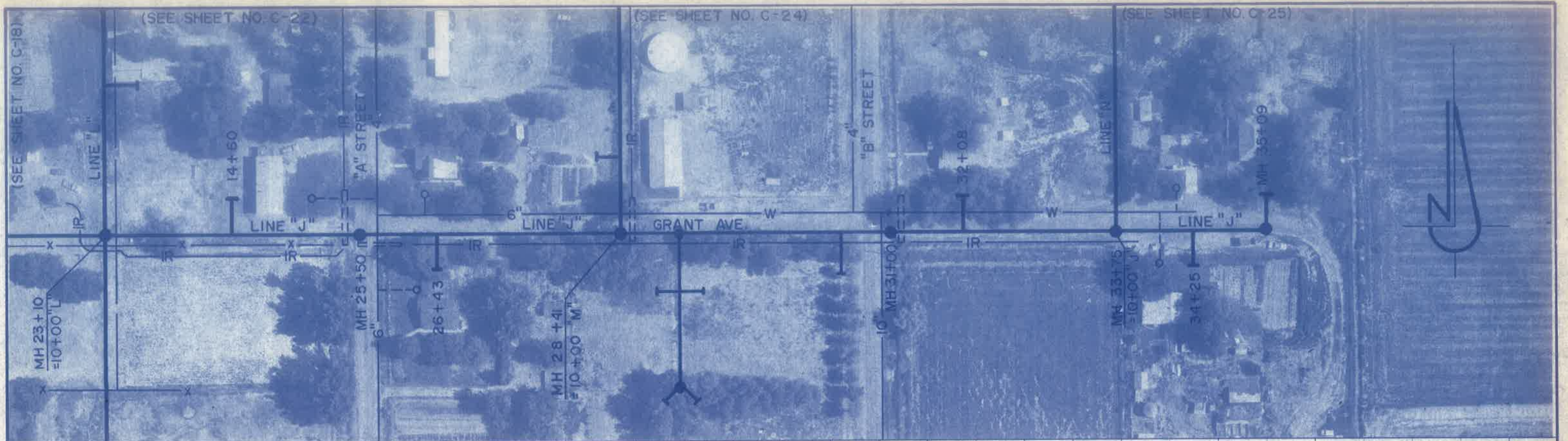


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE		



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "J"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

DESIGNED RSC	CHECKED ACR	DRAWN JGH	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-19	

(SEE SHEET NO. C-18)

A
P-1
NORTH COLLECTOR
PUMP STATION 10+00
= 12+31 "J"

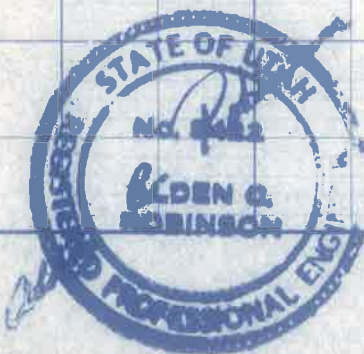
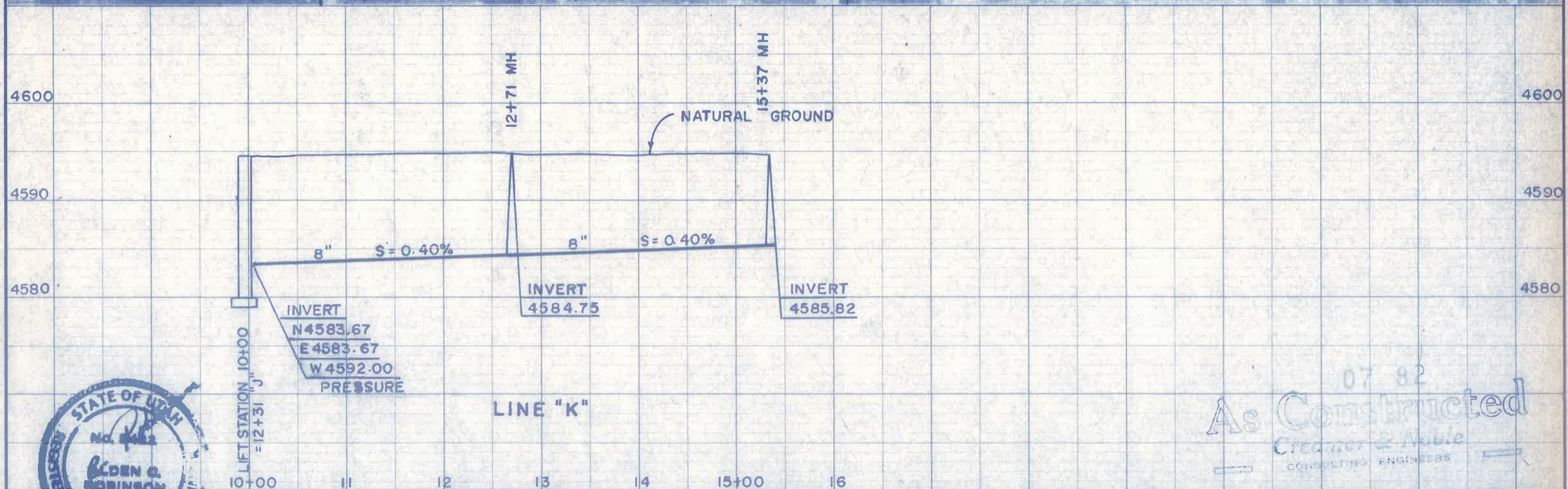
LINE "J"
GRANT
AVE.

12+71 MH

LINE "K"

15+37 MH
WASHINGTON
AVE.

LINCOLN
AVE.



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "K"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

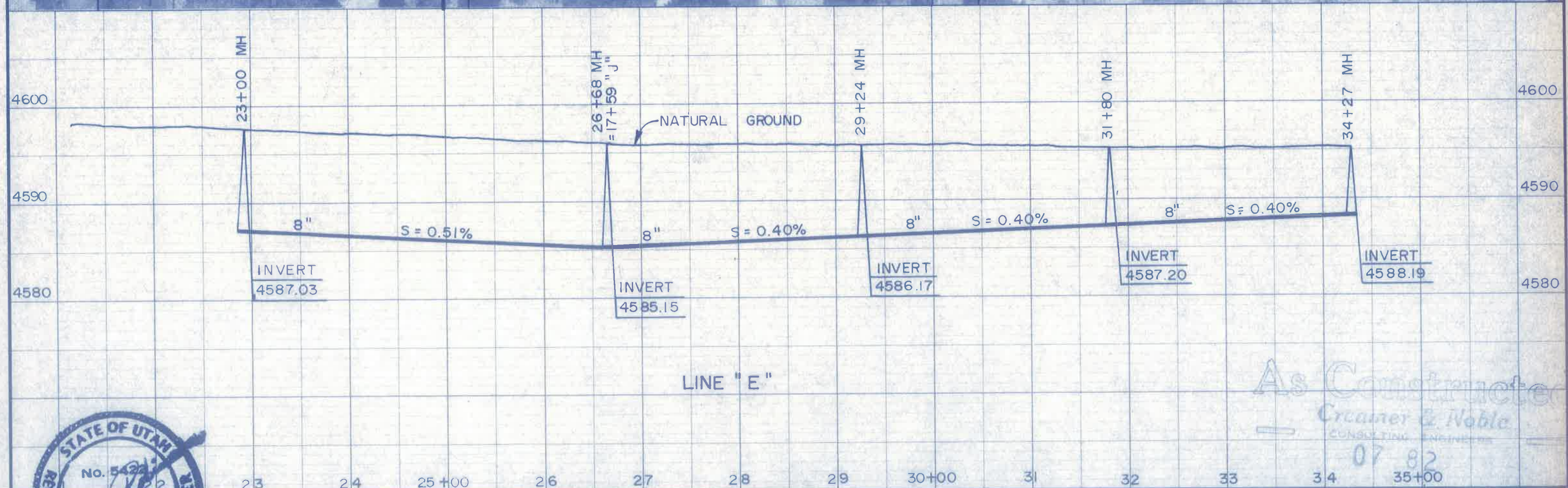
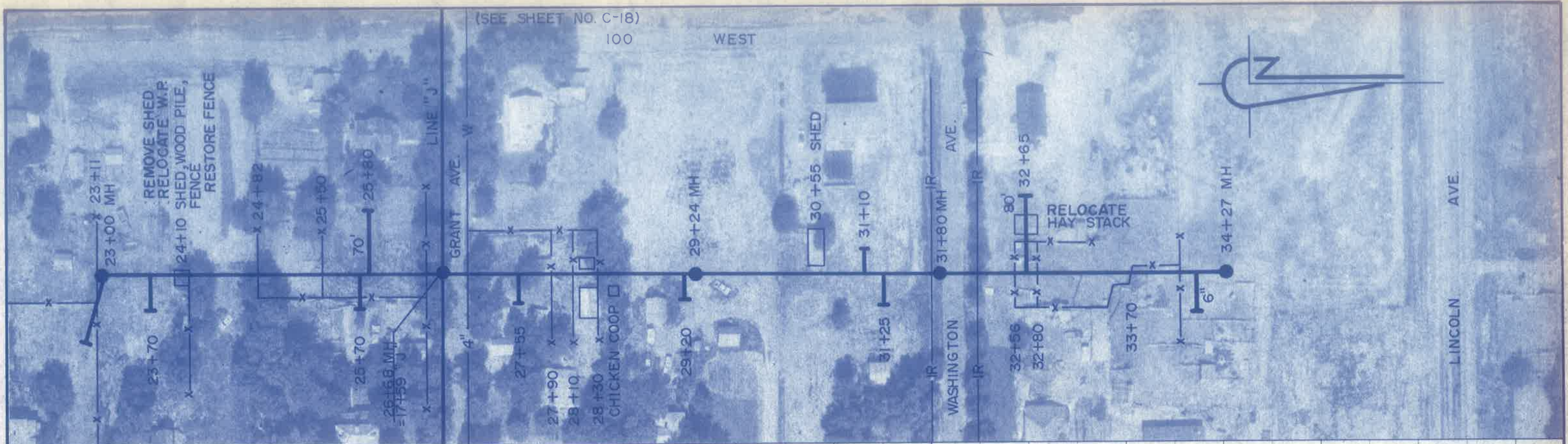
07 82
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

DESIGNED	CHECKED	DRAWN	SCALE
RSC	ACR	BF	1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	
		C-20	

(SEE SHEET NO. C-18)

100

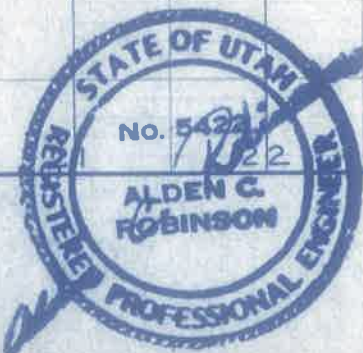
WEST



LINE "E"

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07 82



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

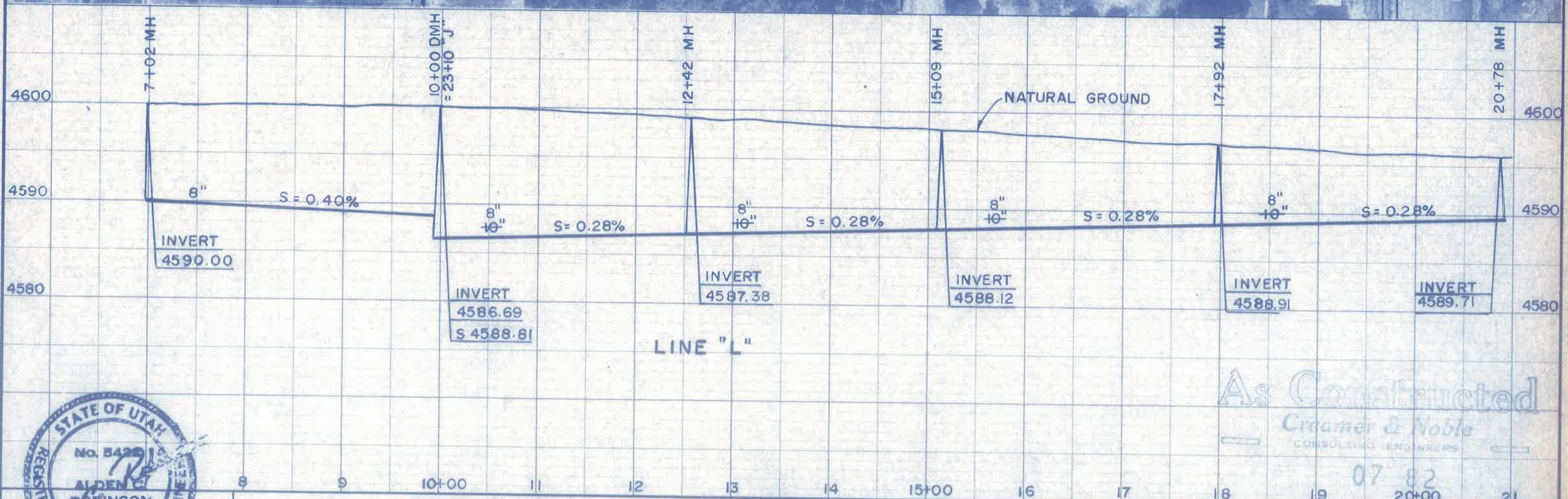
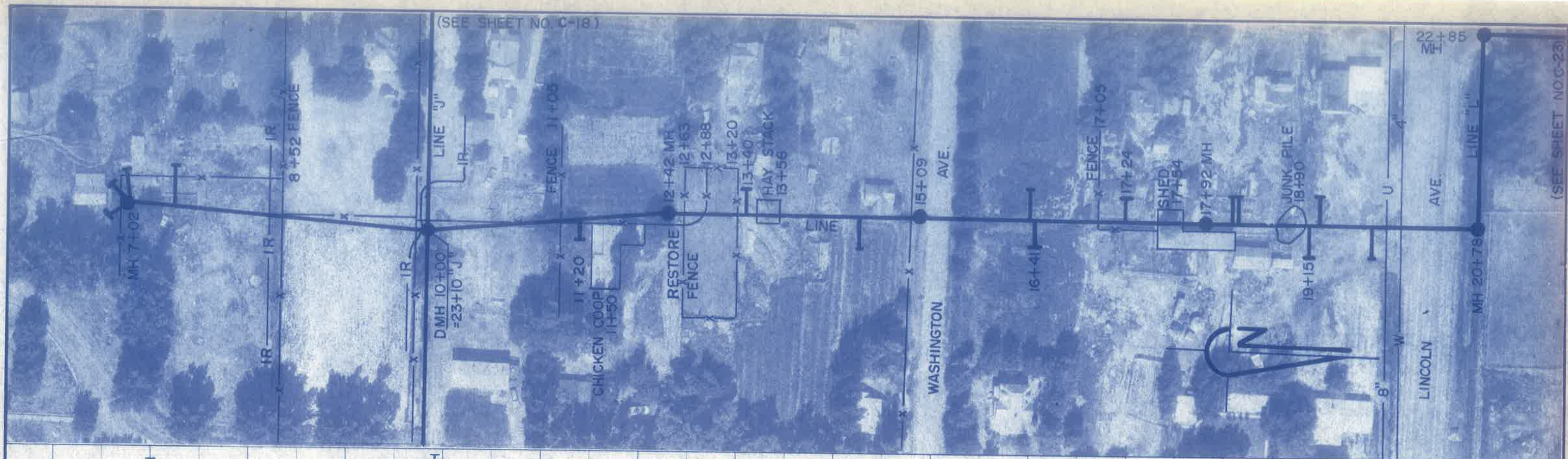
LINE "E"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. C-21	

(SEE SHEET NO. C-18)



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "L"



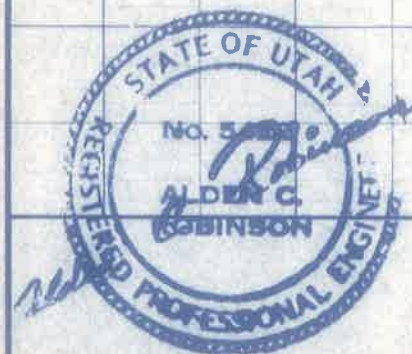
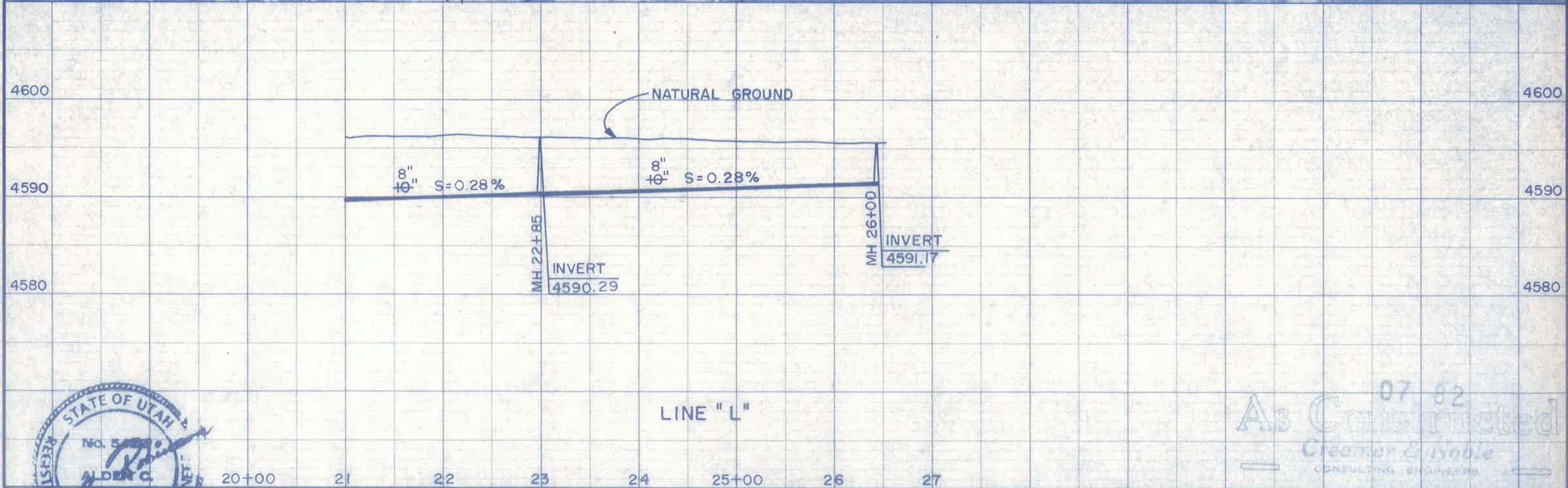
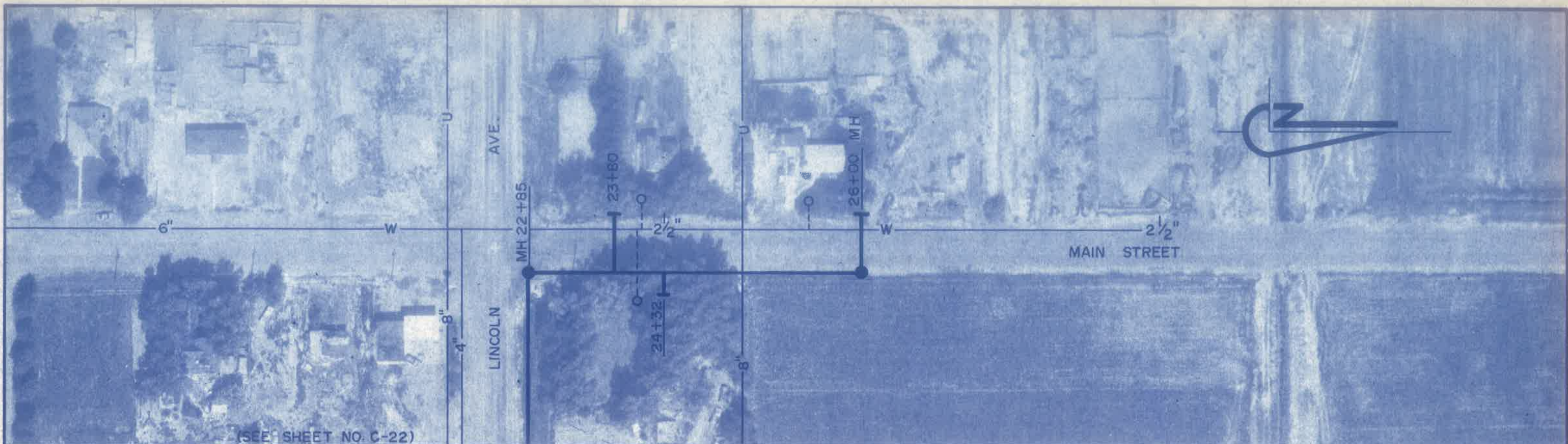
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07 82

DESIGNED RSC	CHECKED ACR	DRAWN BF	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

C-22



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "L"

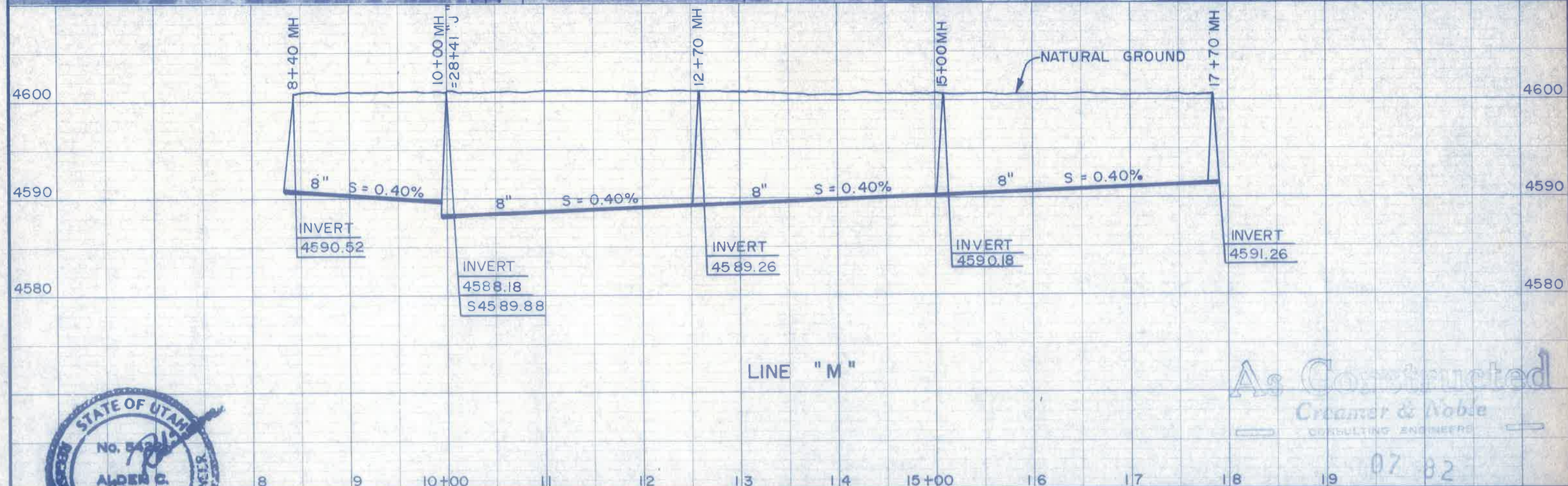
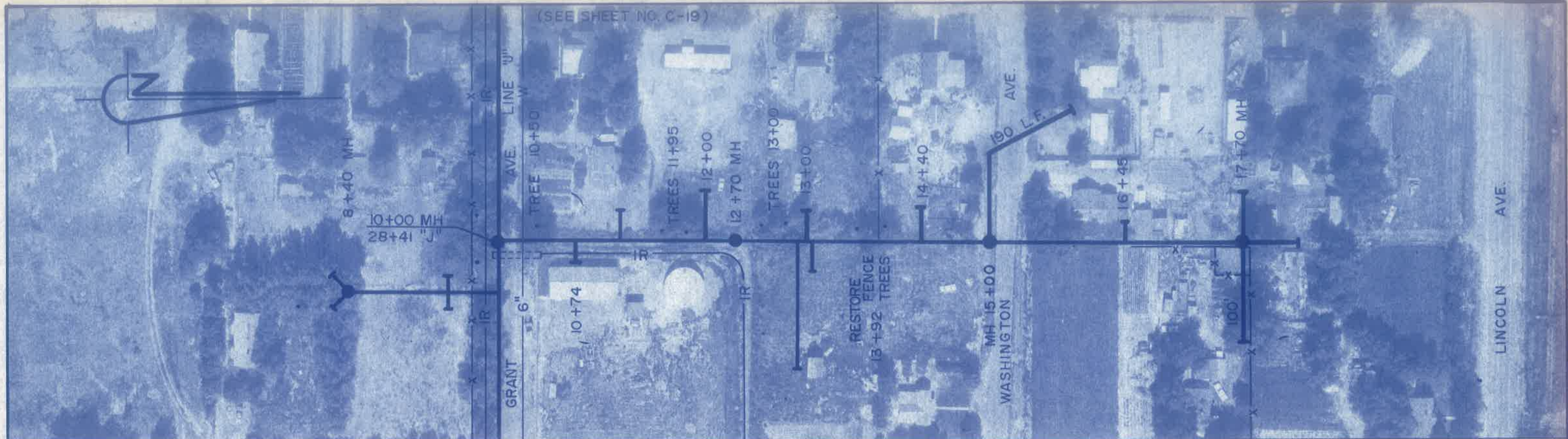


CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

07-82
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

DESIGNED RSC	CHECKED ACR	DRAWN JGH	SCALE 1"=100"
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	C-23

(SEE SHEET NO. C-19)



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

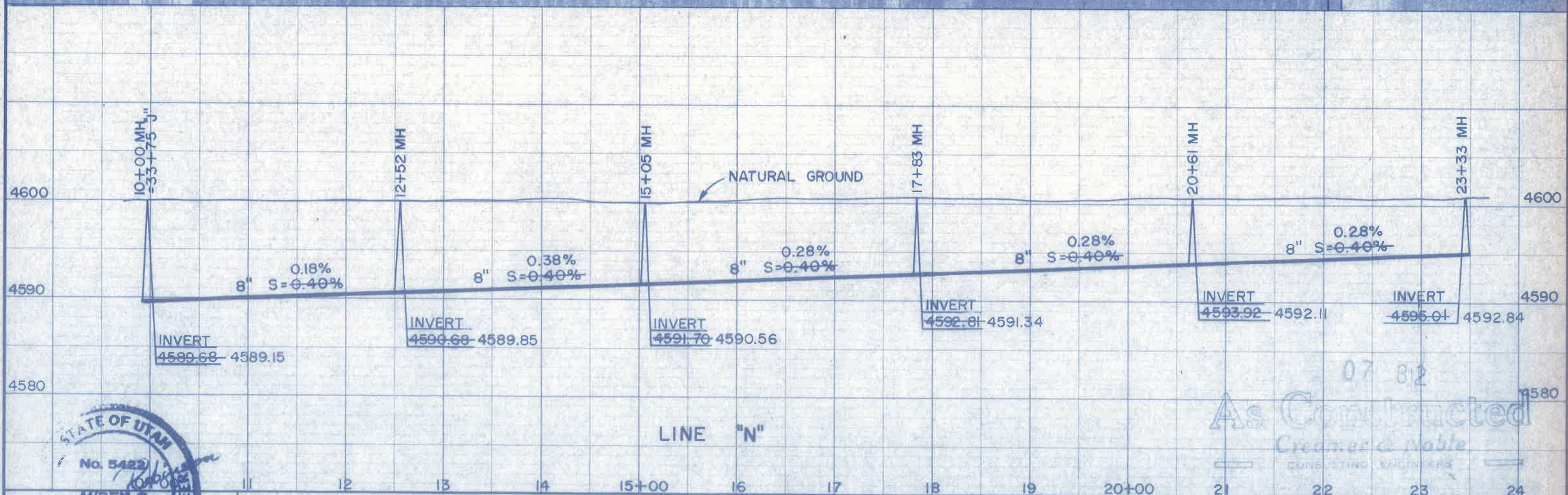
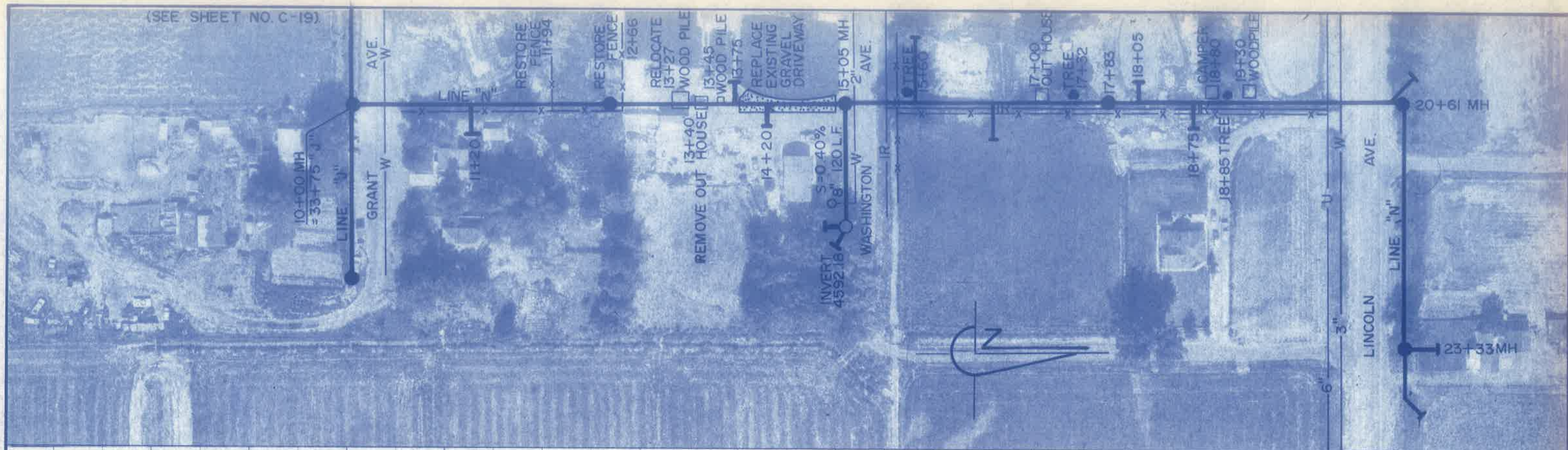


As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07.82

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1" = 100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

(SEE SHEET NO. C-19)



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LINE "N"



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	C-25

P.I. #14B
BM REBAR
ELEV. 4578.43

FUTURE SECONDARY LAGOON

CONTRACTOR TO RELOCATE EXISTING
IRRIGATION DRAIN DITCH AROUND LAGOONS

TRANSFER
STRUCTURE NO. 3
(K L-3)

PROPERTY
CORNER

OFFSET FROM BASELINE

PROPERTY
CORNER

NOTE:
TOP OF DIKE
ELEVATIONS
INCLUDE 0'-6"
OF UNTREATED
BASE COURSE

POND 1
FINISH BOTTOM ELEV. 4577.8
MID. POND - 7.17 Ac
MIN. WS. 4580.8
MAX. WS. 4583.8

POND 2
FINISH BOTTOM ELEV. 4576.8
MID. POND - 7.17 Ac
MIN. WS. 4579.8
MAX. WS. 4582.8

COUNTY ROAD

CONSTRUCT 65' OF 20'
GRAVEL ROAD

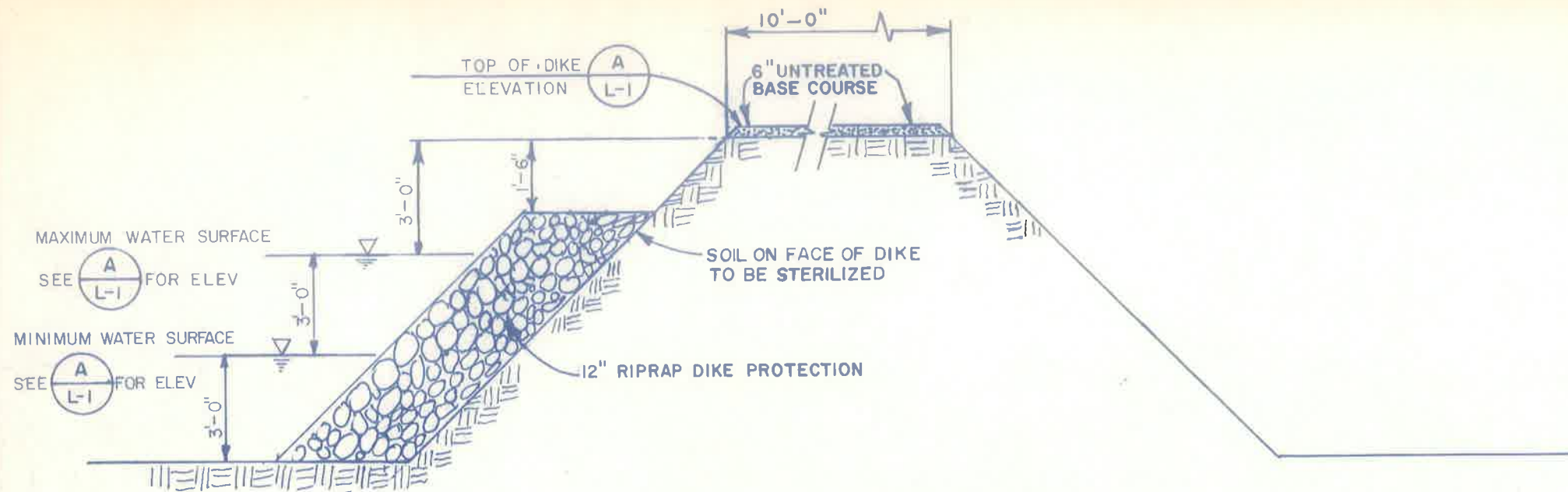
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LAGOON SITE

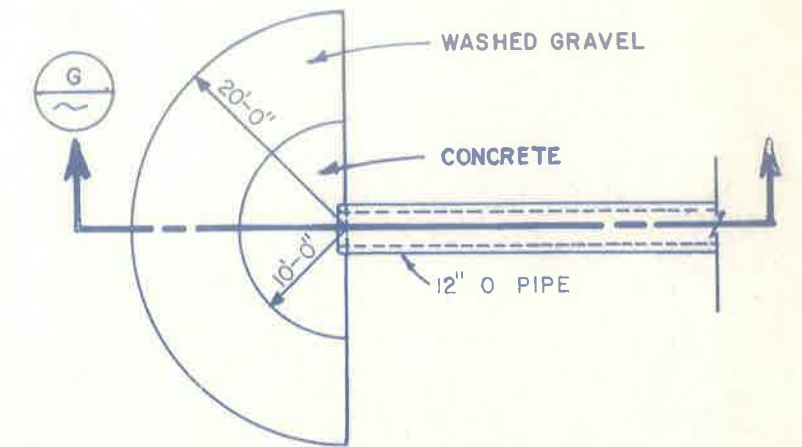


CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

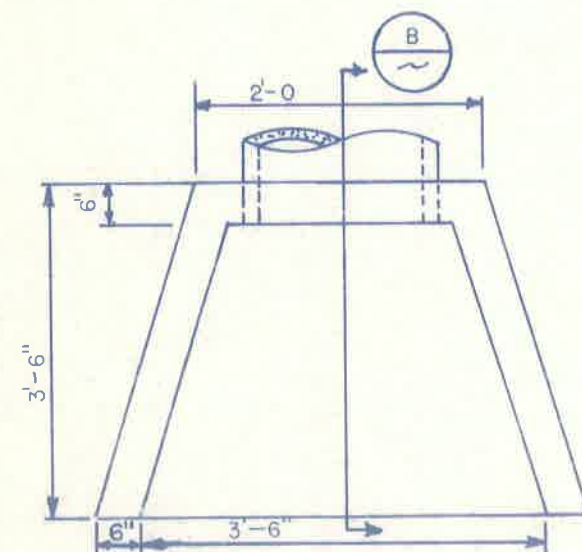
DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE 1"=100'
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. L-1	



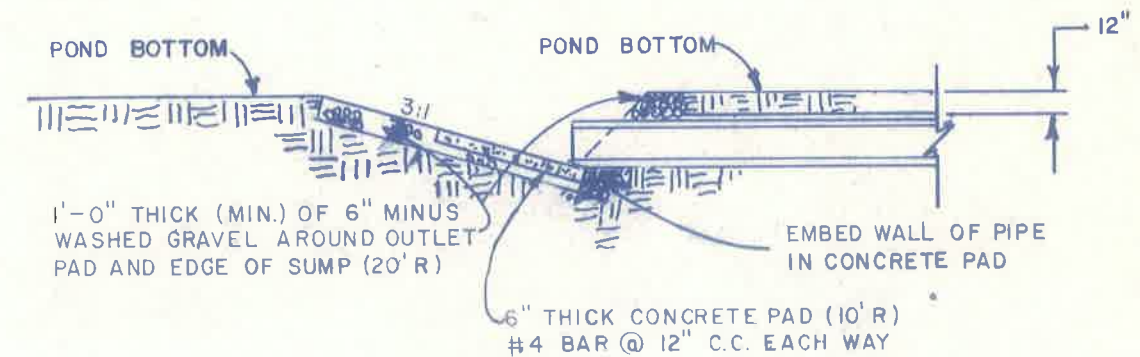
(D L-1) **DIKE DETAIL**



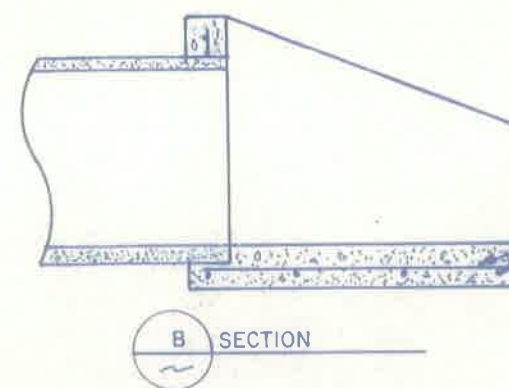
(F L-1) **PLAN - LAGOON INLET PAD**



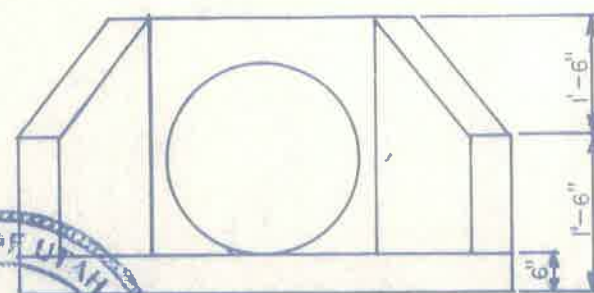
(E L-1) **PIPE INLET**



(G L-1) **SECTION**



PLAN



ELEVATION



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LAGOON DETAILS



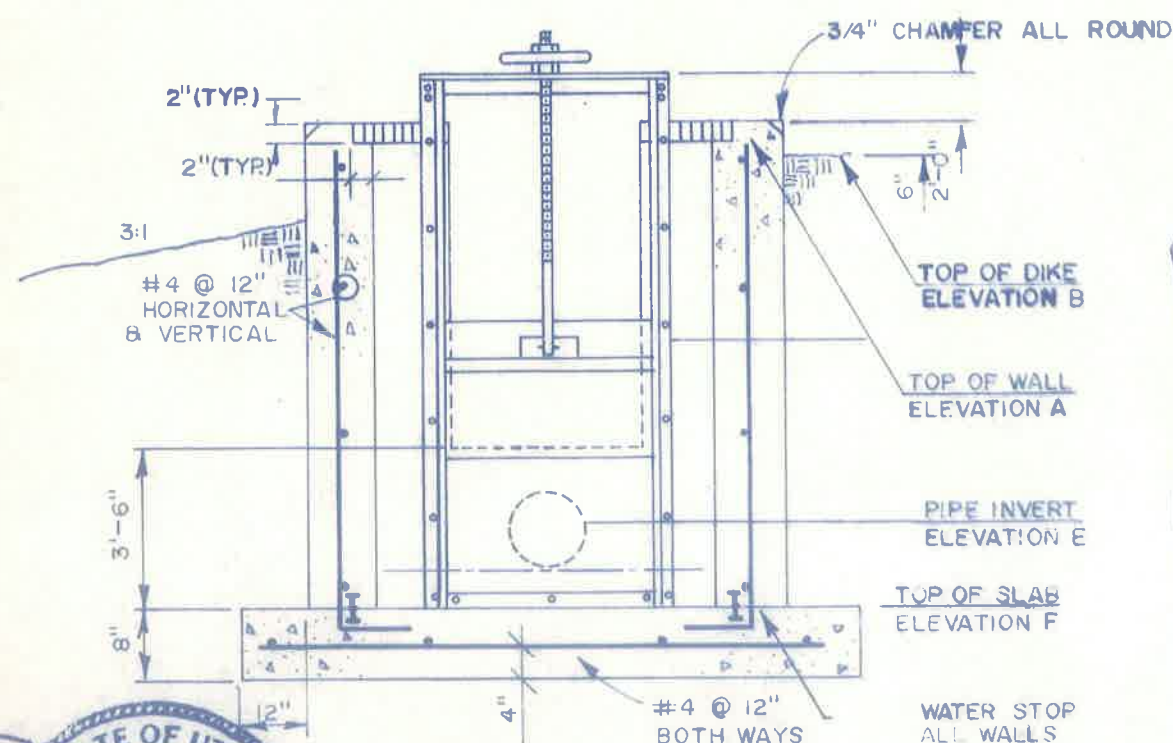
DESIGNED RSC	CHECKED ACR	DRAWN JLT/F	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	L-2

As Constructed
Creamer & Noble
ENGINEERS
07-82

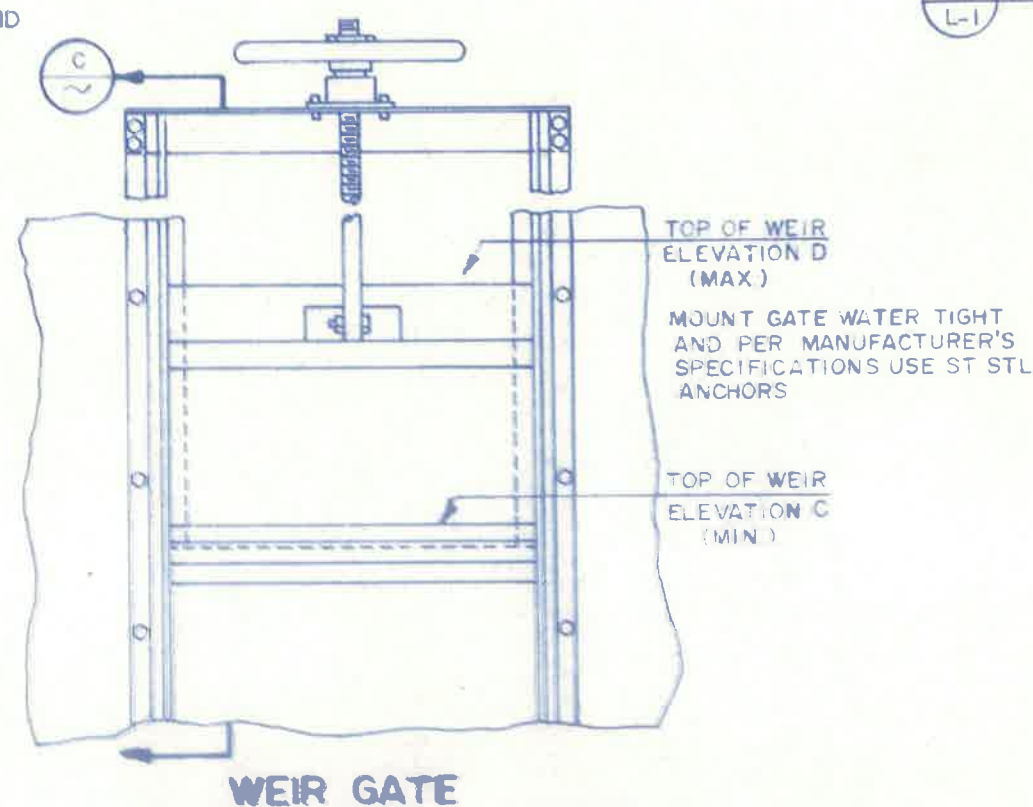
TRANSFER STRUCTURE ELEVATIONS							
STRUCTURE NO.	A	B	C	D	E	F	G
1	4587.8	4587.3	4580.8	4583.8	4577.8	4576.8	4580.3
2	4587.8	4587.3	4580.8	4583.8	4577.8	4576.8	4580.3
3	4586.8	4586.3	4579.8	4582.8	4576.8	4575.8	4579.3
4							

LOCATION	OPENING SIZE W x H	GATE MODEL		QTY.	TYPE OF CLOSURE	GATE DESIGN PRESSURE		MAX. OPERATING PRESSURE	WALL CASTING	TYPE OF FRAME	MIN. STEM	OPERATOR MODEL	
		WATER- MAN	ARMCO			SEATING (FT.)	UNSEATING (FT.)					WATER- MAN	ARMCO
TRANSFER STRUCT	24x36	R-10	10-00	1	SQUARE	10	0	3	SP100T	FLAT	1 1/2"	2P-18	HPB-18

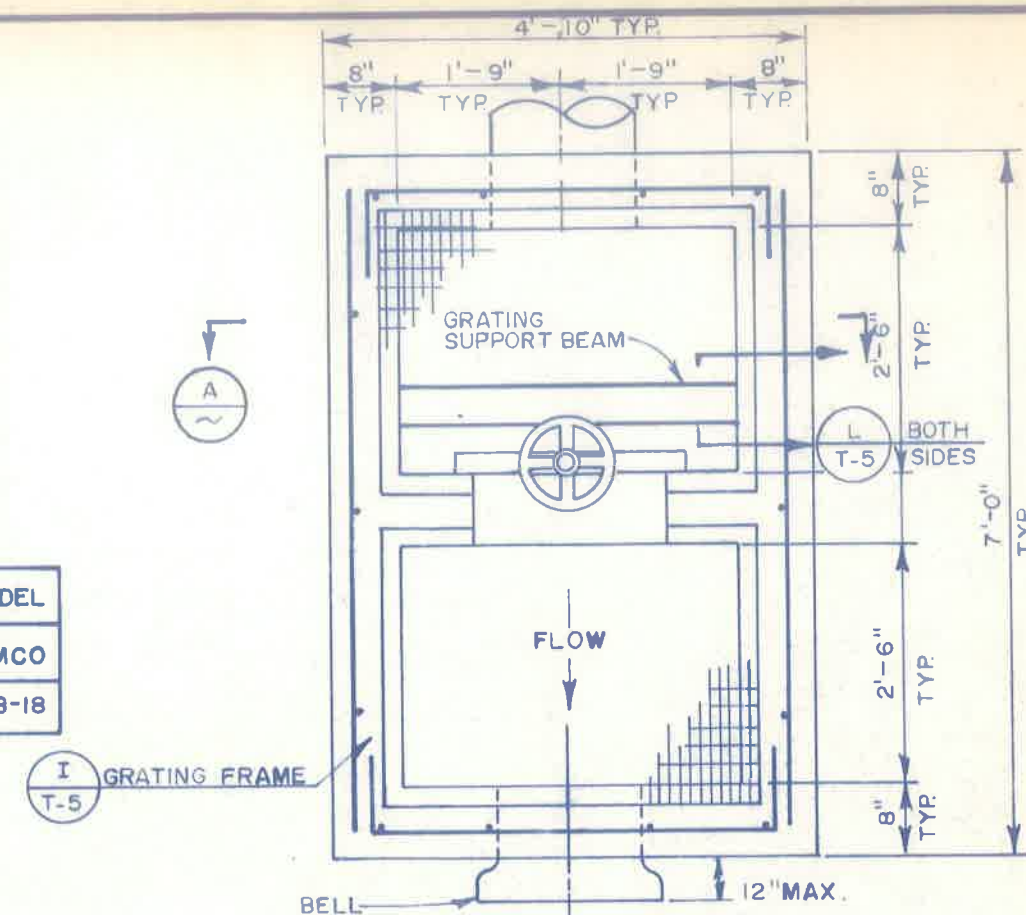
REQUIRED CONCRETE FINISH:
CLASS II ON EXPOSED EXTERIOR WALLS.
ORDINARY ON INTERIOR AND BURIED EXTERIOR WALLS.



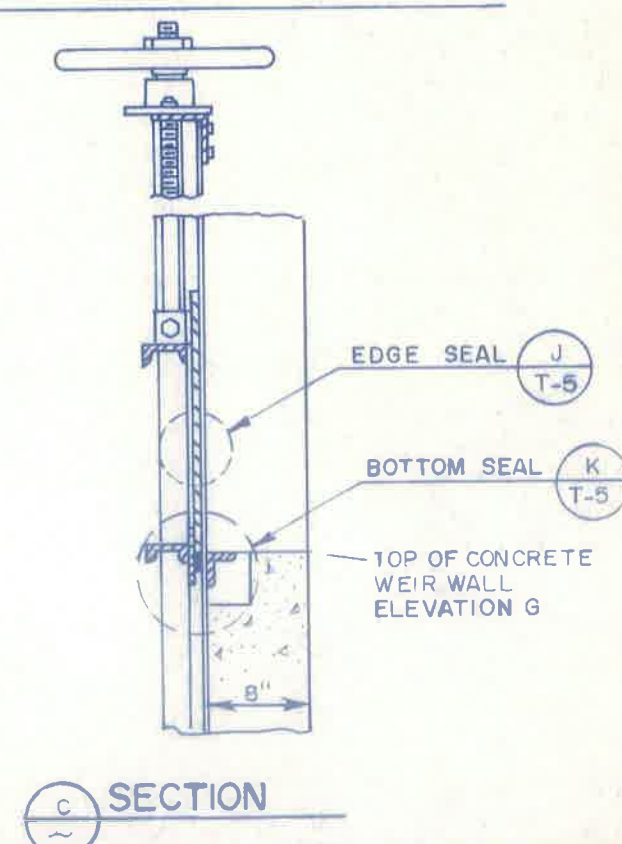
A TYPICAL SECTION



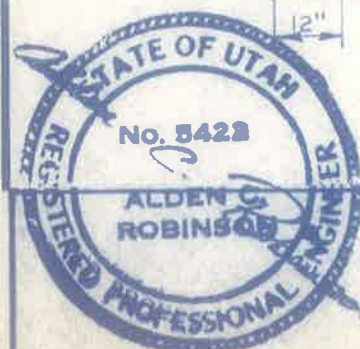
WEIR GATE



K L-1 TRANSFER STRUCTURE



C SECTION



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

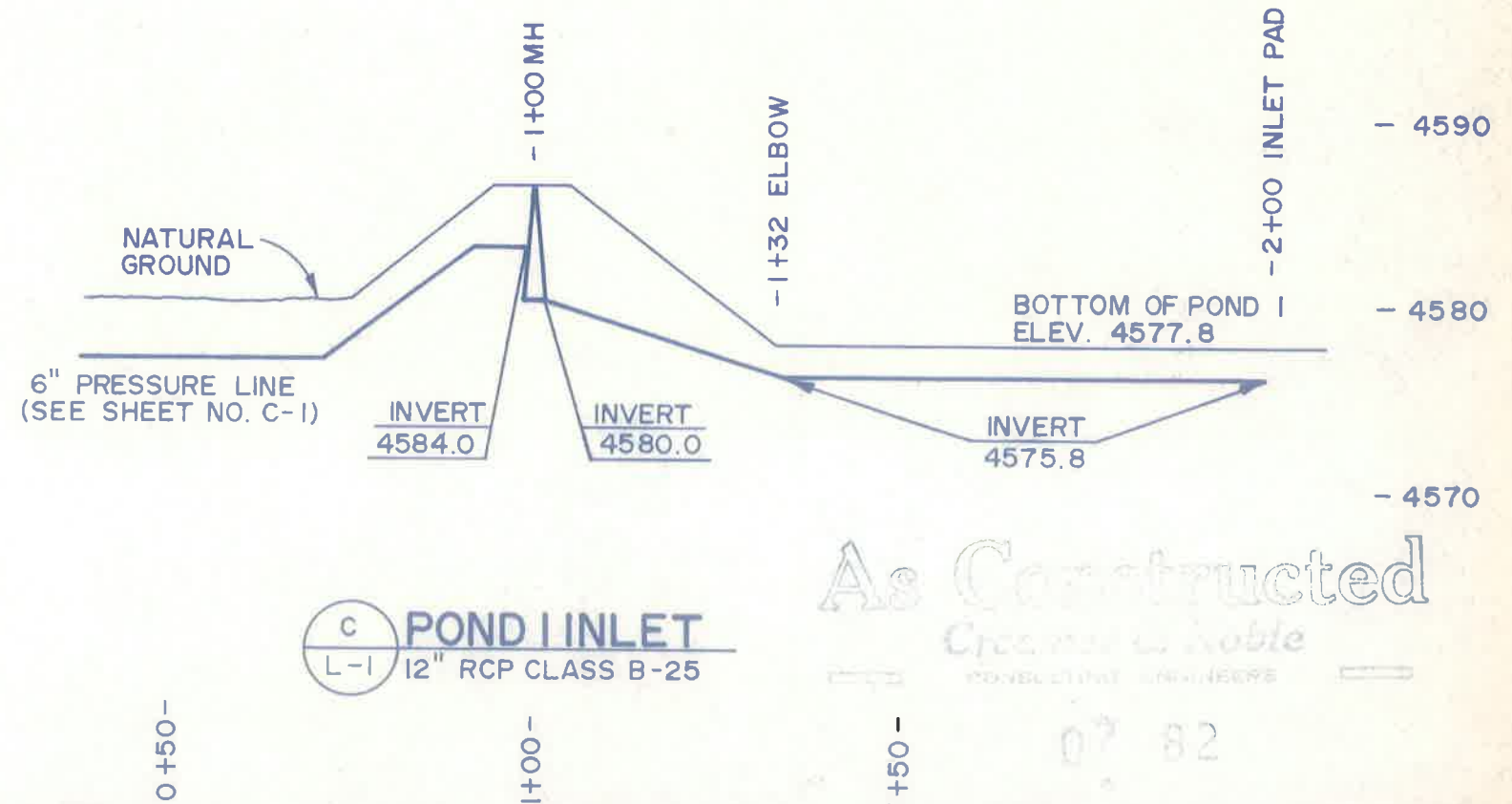
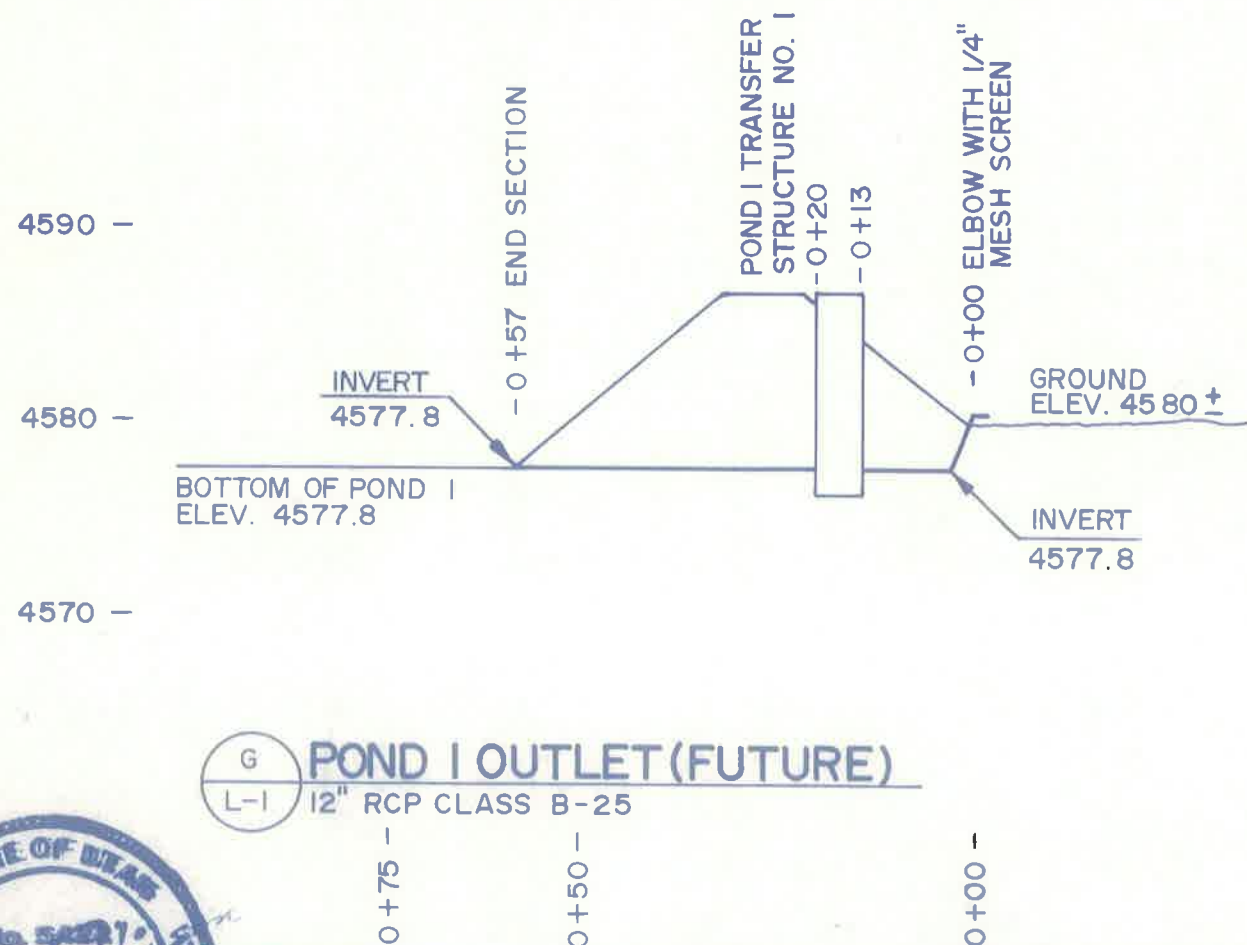
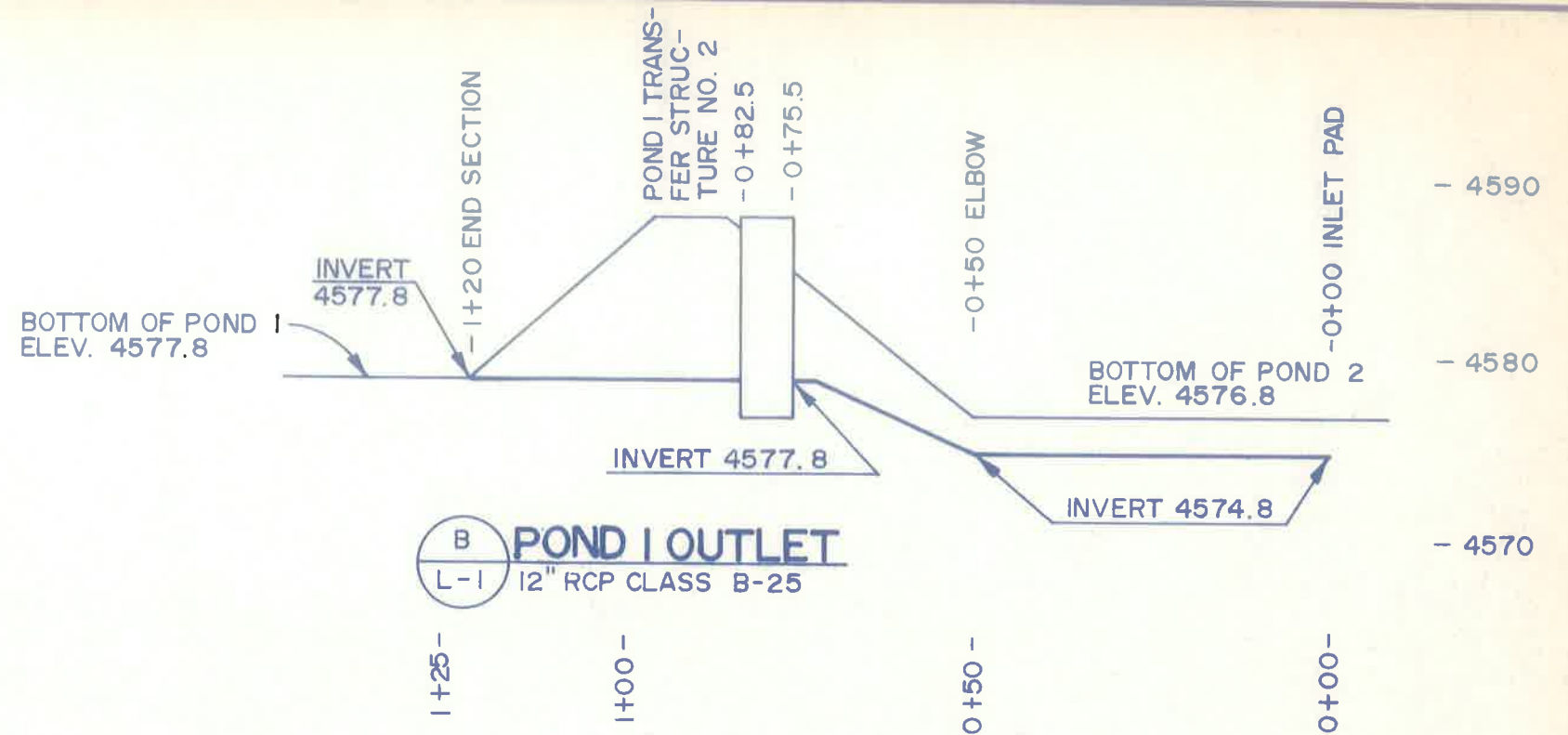
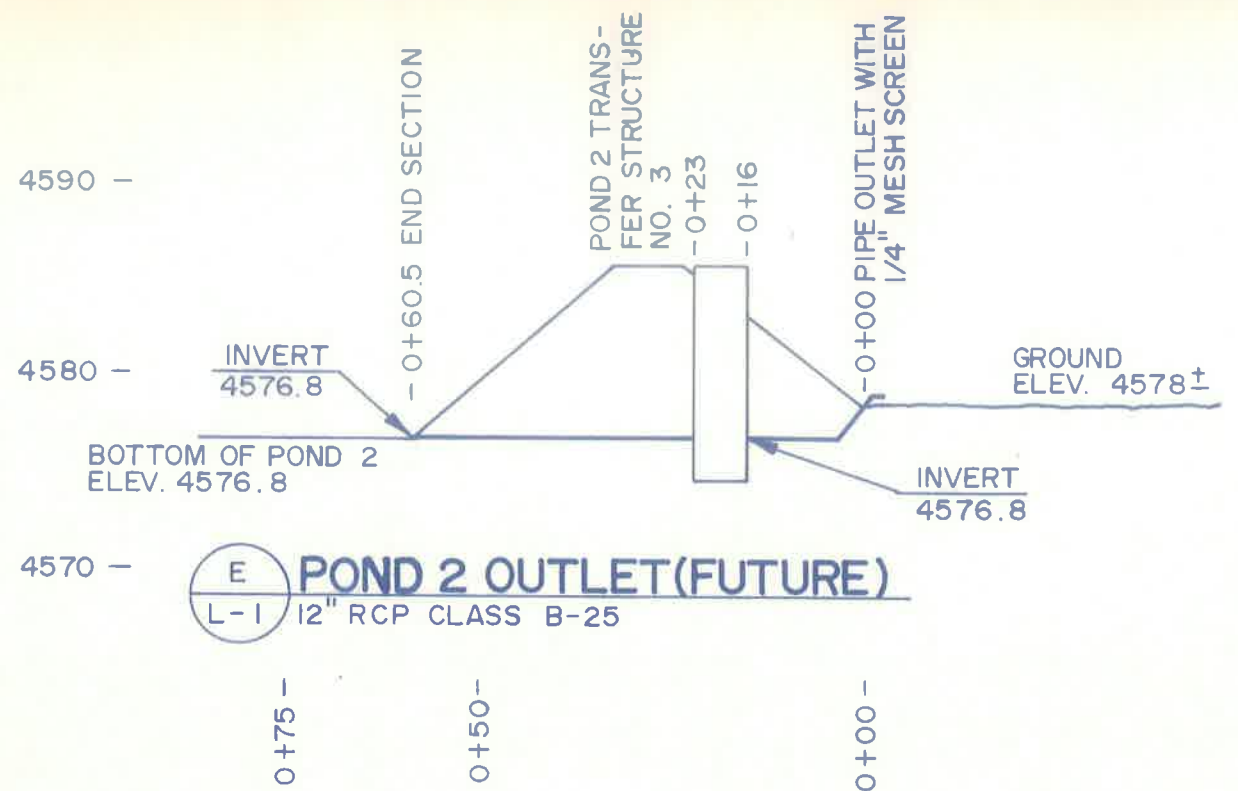
DETAIL



DESIGNED RSC	CHECKED ACR	DRAWN RH	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	

L-3

Constructed
 Creamer & Noble
 CONSULTING ENGINEERS
 07-82



As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07 82

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

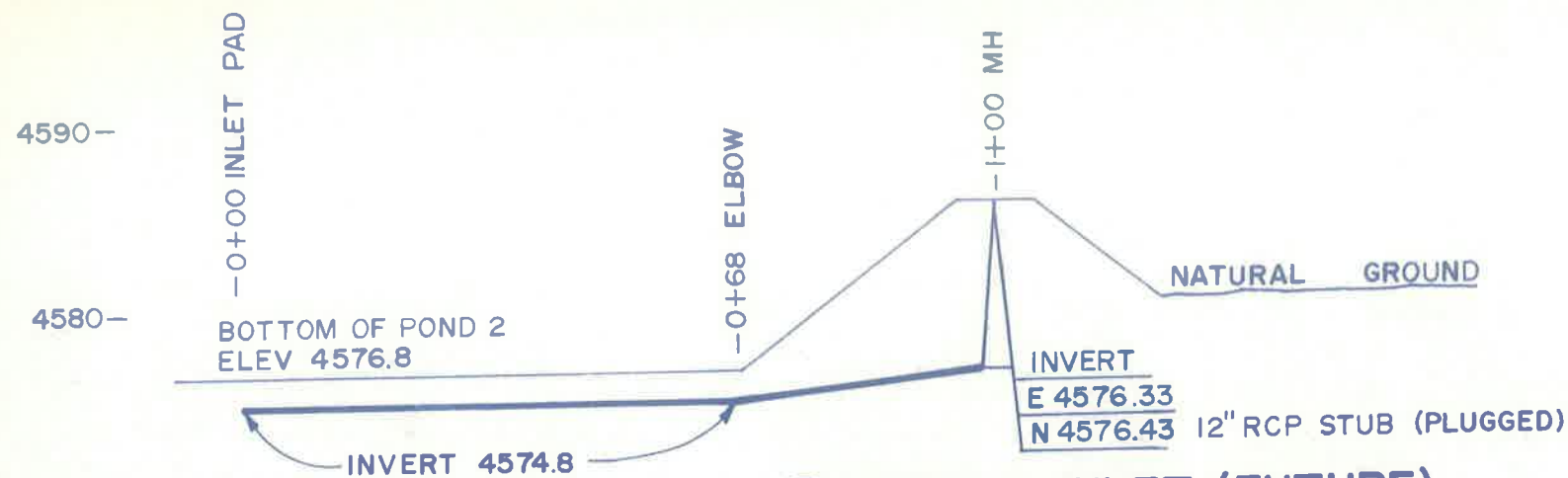
PIPE PROFILE



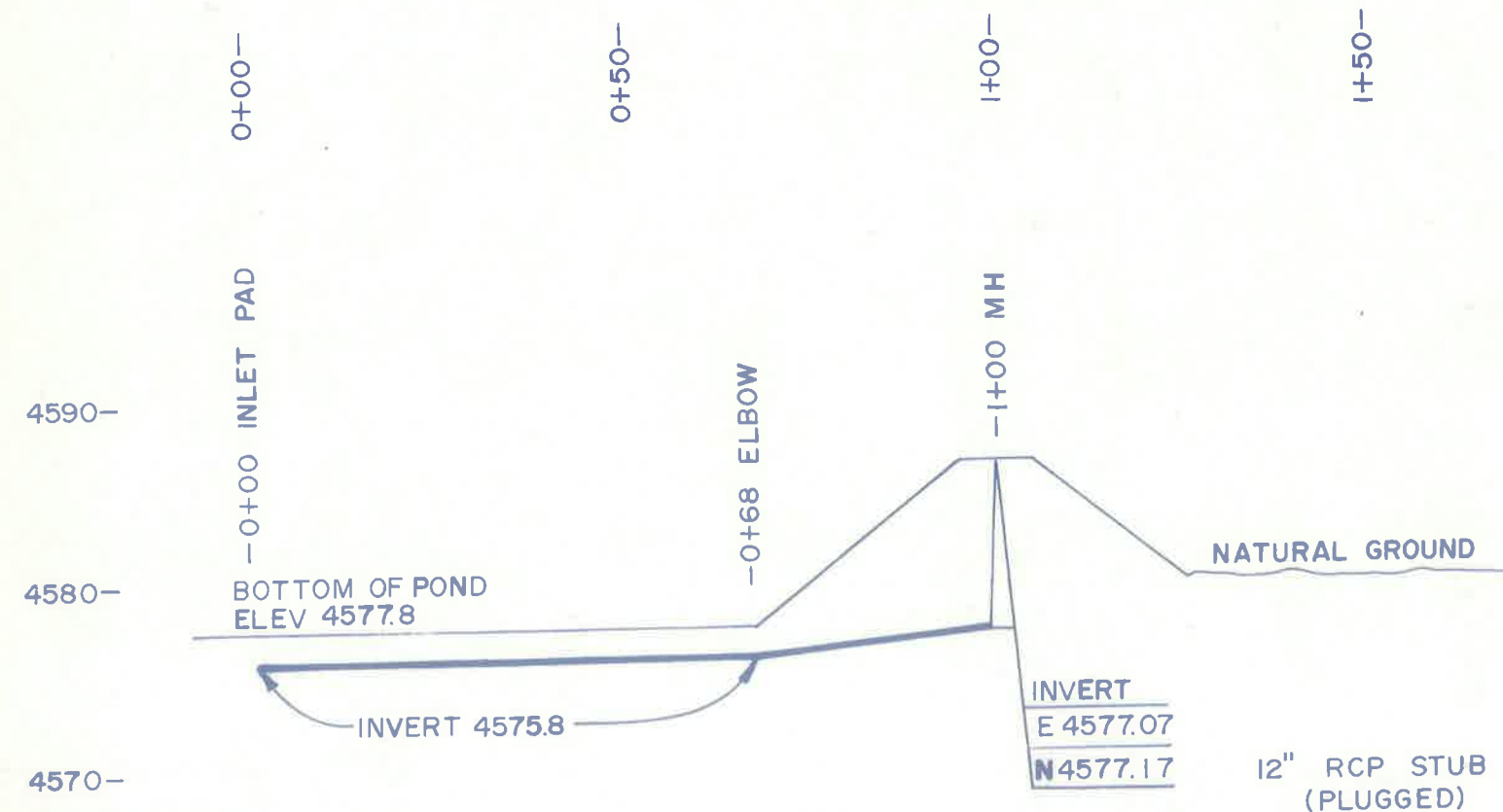
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JS	SCALE NONE
APPROVED	DATE 10/81	PROJECT NO.	
REVISION	DATE	SHEET NO.	



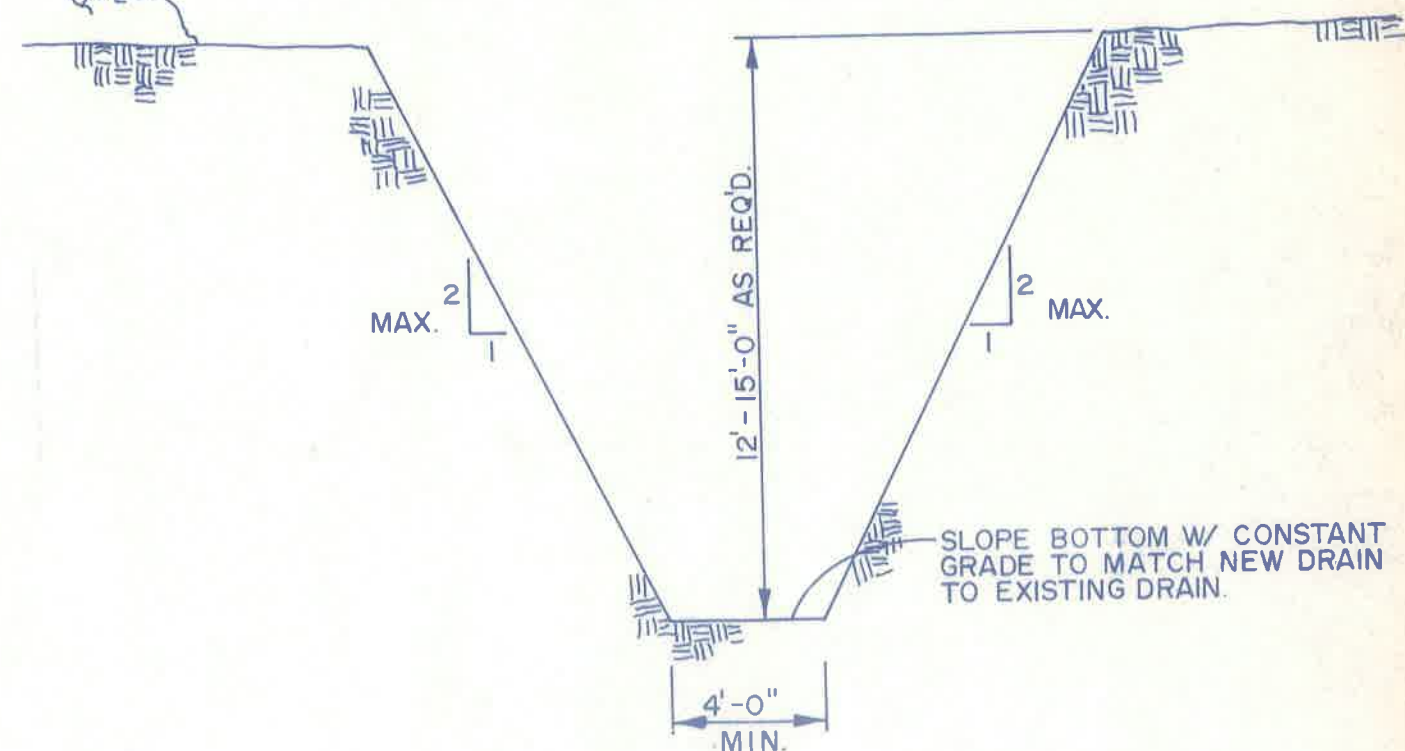


POND 2 INLET (FUTURE)
 H
 L-1 12" RCP CLASS B-25



POND 1 INLET (FUTURE)
 J
 L-1 12" RCP CLASS B-25

SPOIL BANK. PILE ALONG SIDE EXCAVATION
 SIMILAR TO EXISTING SPOIL BANKS OR USE
 IN LAGOON EMBANKMENT.



NOTE:

1. RELOCATE EXISTING DRAIN DITCH IS PART OF LAGOON CONSTRUCTION AS SHOWN ON SHEET NO. L-1.
2. FEATHER NEW DRAIN INTO EXISTING DRAIN. FILL ABANDONED DRAIN. DRESS-UP AND FINE GRADE FINAL WORK.

RELOCATION OF IRRIGATION DRAIN DITCH
 A
 L-1 TYPICAL CROSS-SECTION

07 '82 *As Constructed*
 Creamer & Noble



TOWN OF HINCKLEY



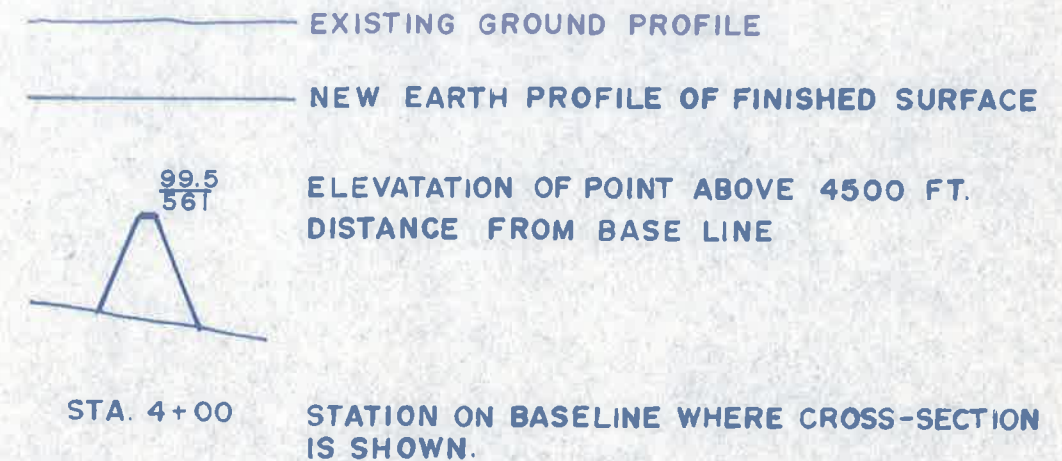
CREAMER & NOBLE ENGINEERS

DESIGNED RSC	CHECKED ACR	DRAWN LOB	SCALE NONE
APPROVED	DATE	PROJECT NO.	
		SHEET NO.	

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
LAGOON EXCAVATION (1)	CU.YD.	46,888
LAGOON EMBANKMENT (2)	CU.YD.	39,317
UNTREATED BASE COARSE	CU.YD.	729
RELOCATION OF EXISTING IRRIGATION DRAIN DITCH	L.F.	1,400
RIP RAP DIKE PROTECTION (3)	SQ.YD.	11,520
INLET STRUCTURE	EA.	3
INLET PAD	EA.	4
TRANSFER STRUCTURE	EA.	3
12" R.C.P.	L.F.	
4' DIA. MANHOLE	EA.	3
CHAIN LINK FENCE	L.F.	3,984
20' GATE	EA.	1
LAGOON WARNING SIGNS	EA.	10

CROSS SECTION LEGEND



NOTES:

- (1) THIS QUANTITY DOES NOT INCLUDE STRIP AND WASTE.
- (2) THIS QUANTITY DOES NOT INCLUDE ROCK RIP RAP DIKE PROTECTION OR UNTREATED BASE COURSE.
- (3) QUANTITY SHOWN IS CALCULATED SURFACE AREA OF DIKES INSIDE LAGOONS.
- (4) TOP OF DIKE ELEVATIONS DO NOT INCLUDE 0'-6" OF UNTREATED BASE COURSE.



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

QUANTITIES

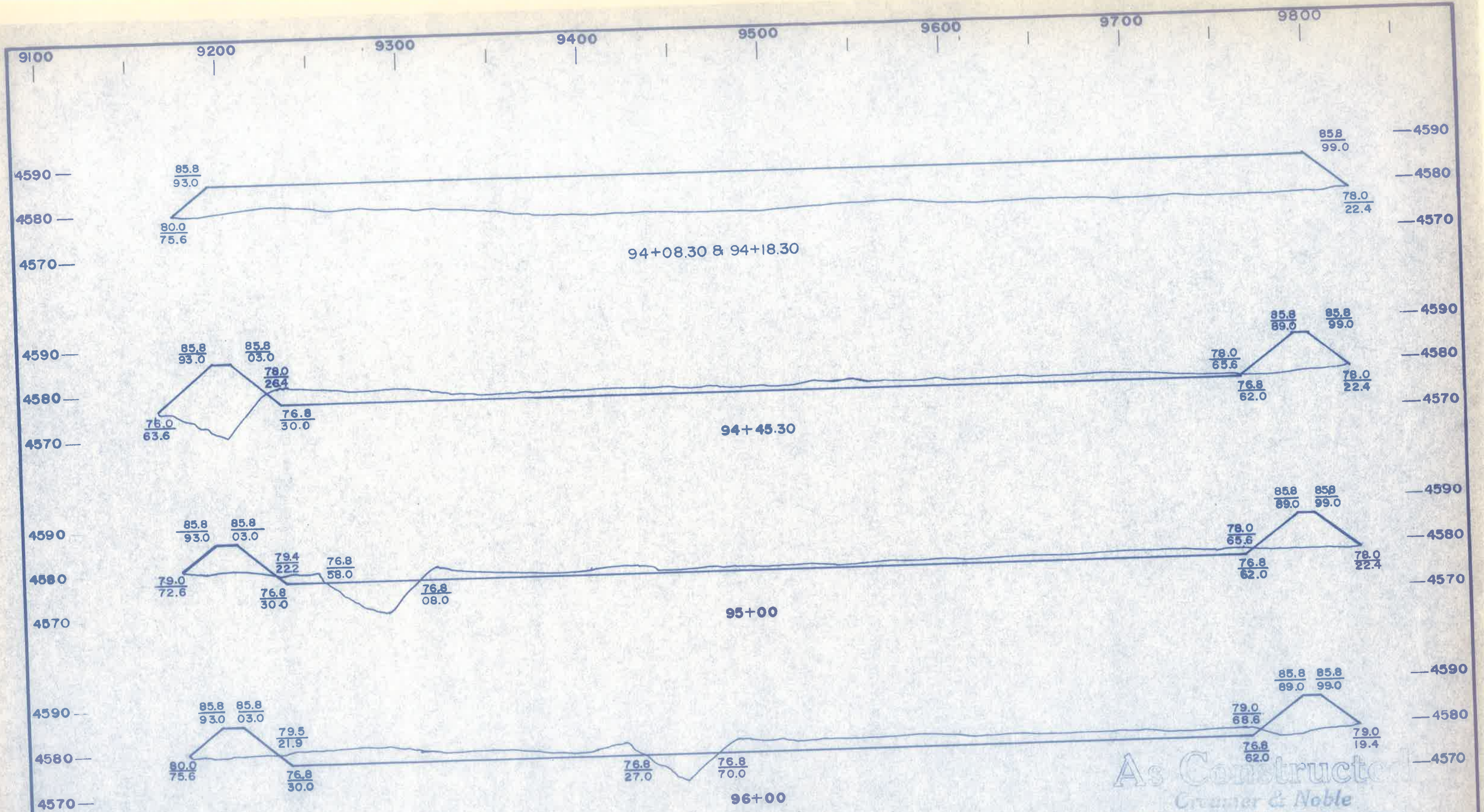


CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

07 82

DESIGNED RSC	CHECKED ACR	DRAWN BF	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



As Constructed
 Creamer & Noble
 CONSULTING ENGINEERS

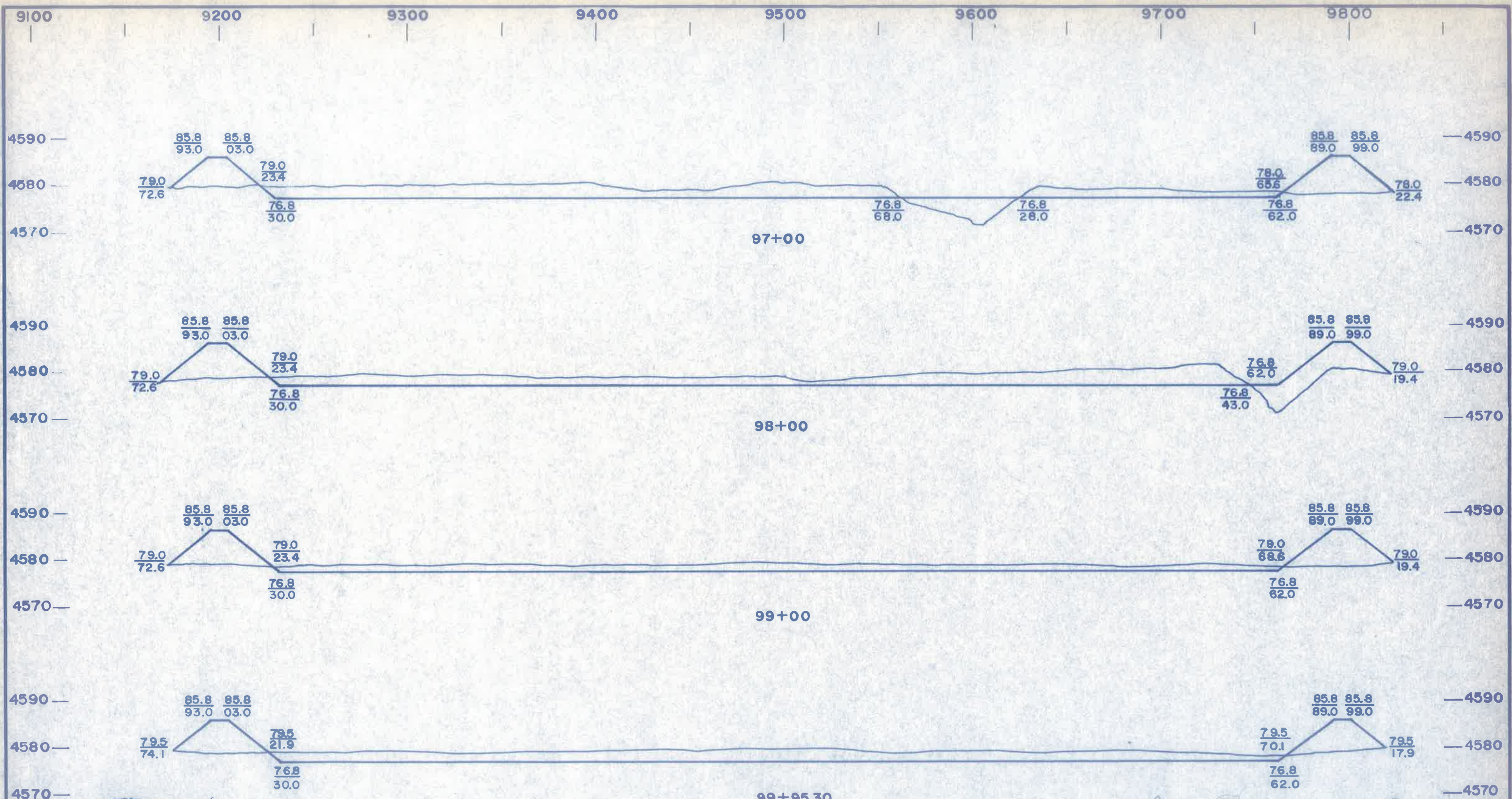


DISTANCE FROM BASELINE

TOWN OF HINCKLEY
 WASTEWATER TREATMENT FACILITIES



DESIGNED RSC	CHECKED ACR	DRAWN JLTF	SCALE AS SHOWN
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	L-7



DISTANCE FROM BASELINE

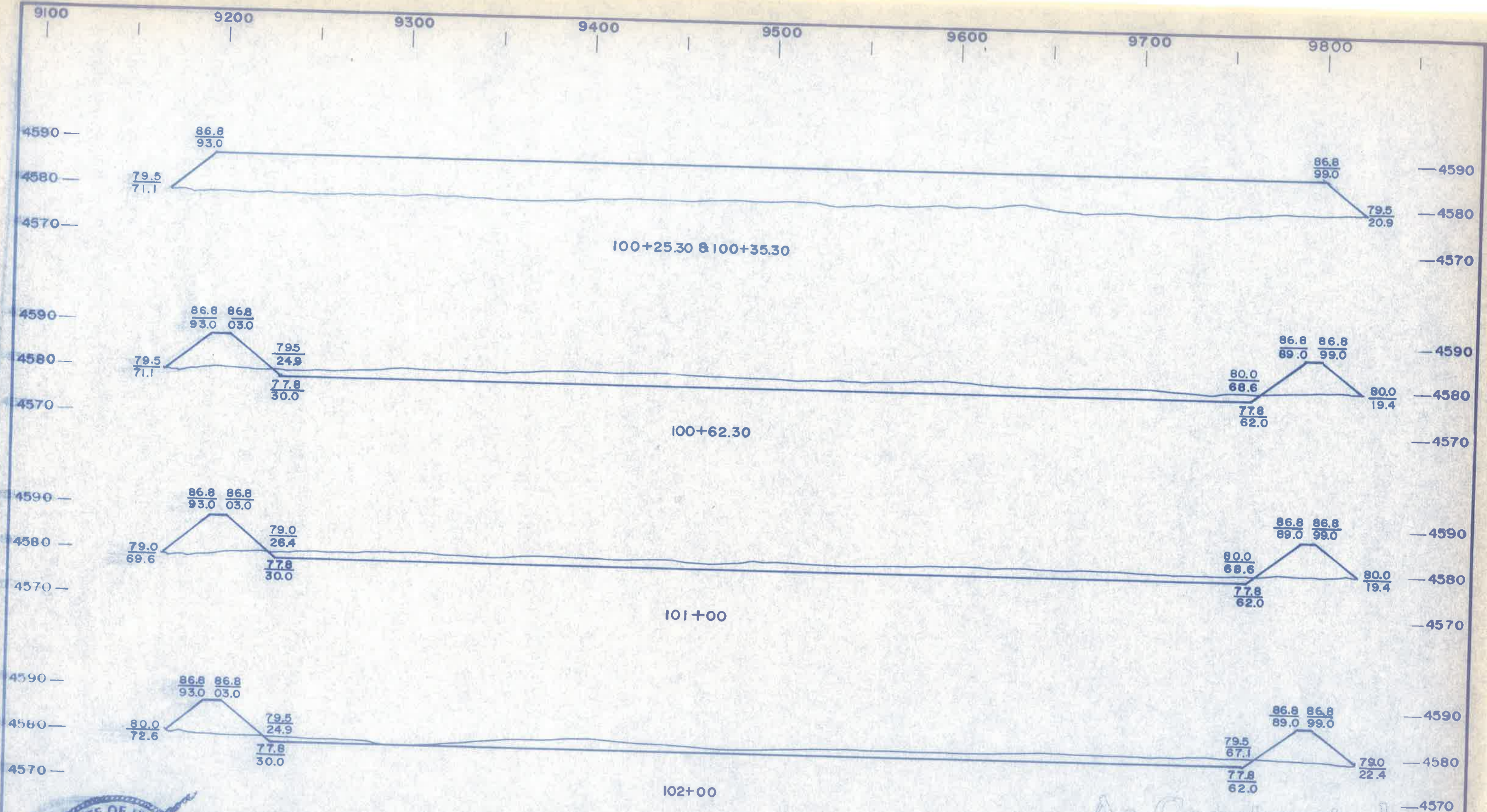
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED R S C	CHECKED A C R	DRAWN J L T F	SCALE AS SHOWN
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	1 - 8



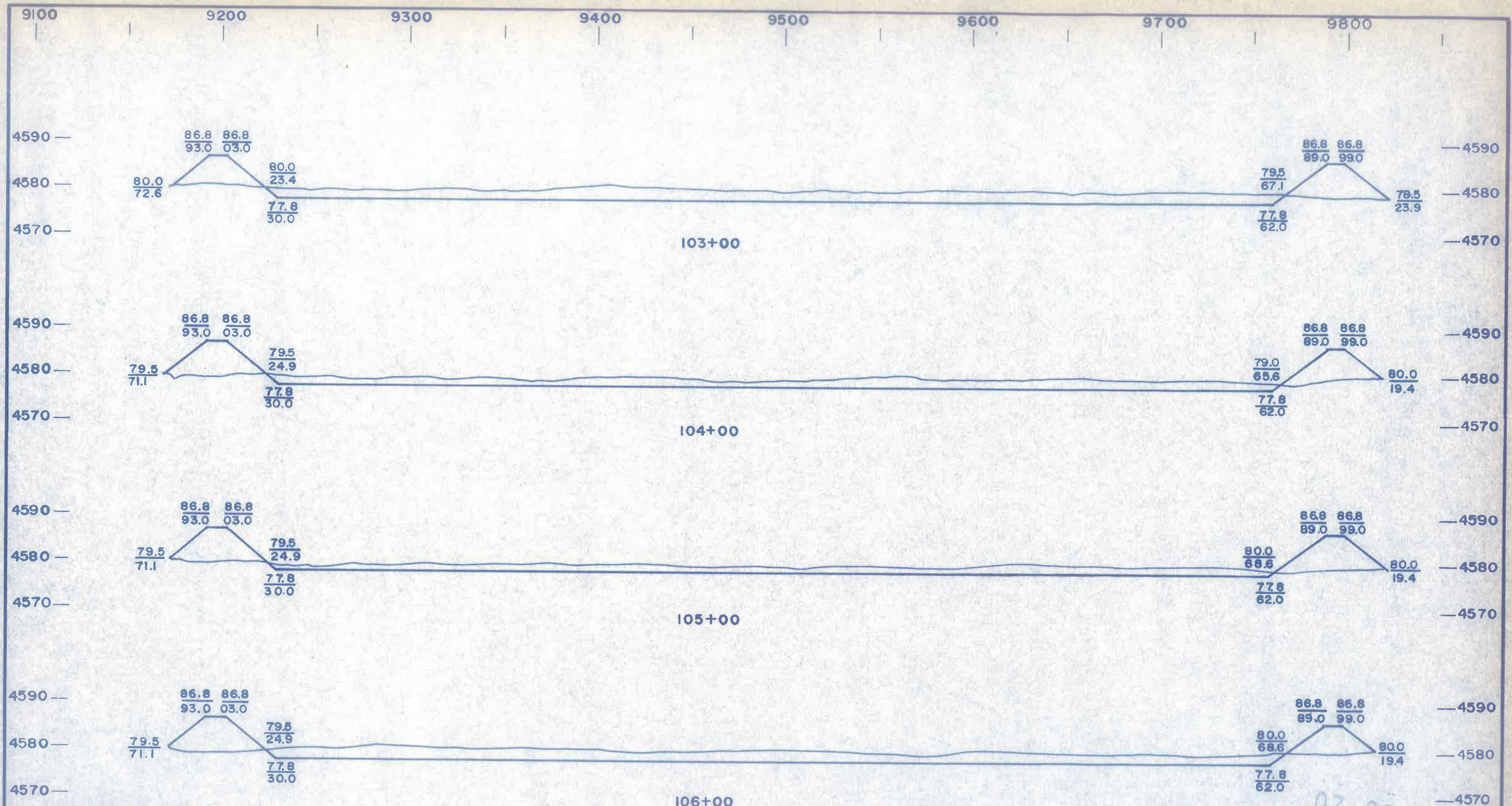
DISTANCE FROM BASELINE

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES
LAGOON CROSS SECTIONS



As Constructed
Creamer & Noble
CONSULTING ENGINEERS

DESIGNED RSC	CHECKED ACR	DRAWN ULTF	SCALE AS SHOWN
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	



DISTANCE FROM BASELINE

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

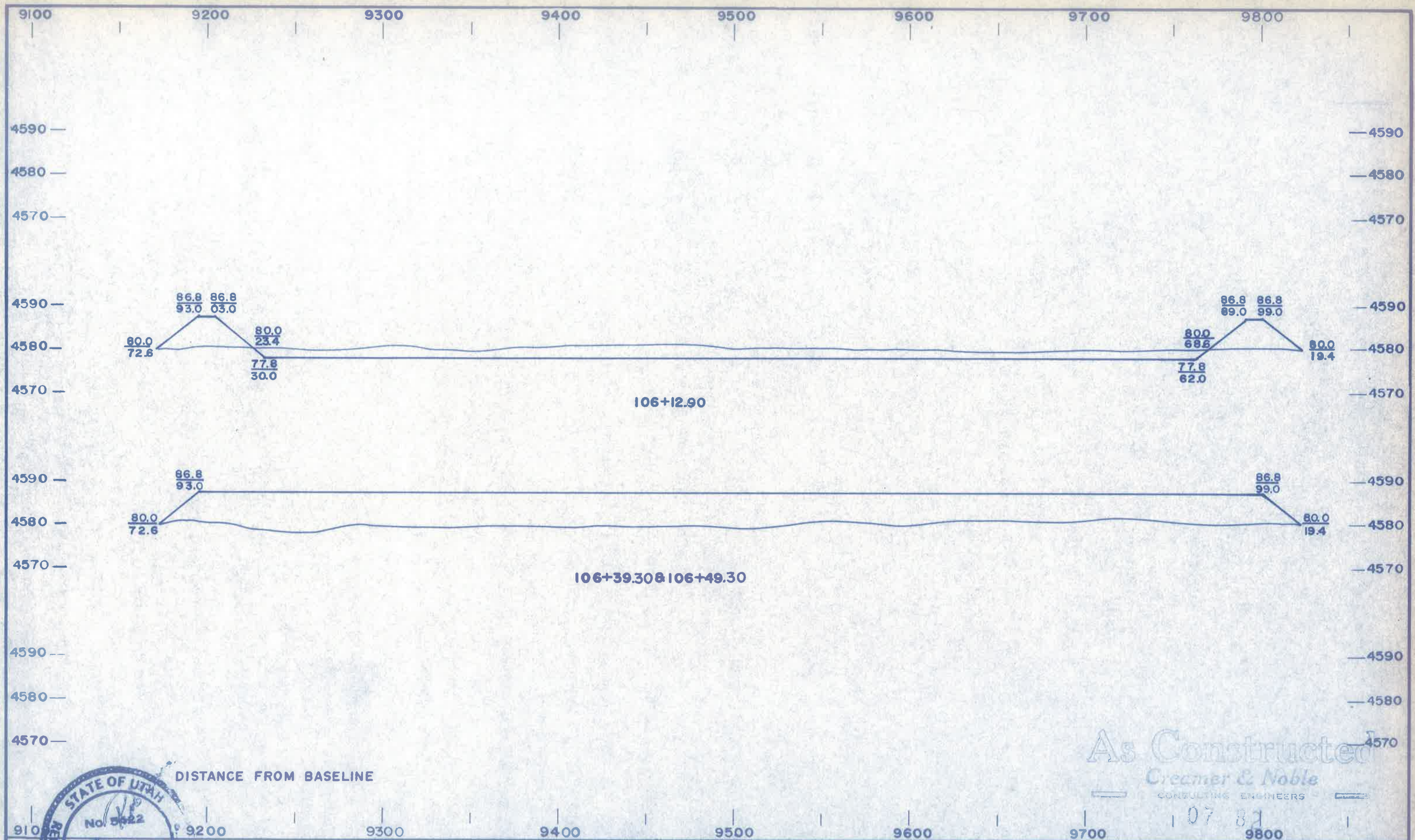
LAGOON CROSS SECTIONS



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

As Constructed
Creamer & Noble
CONSULTING ENGINEERS

DESIGNED R S C	CHECKED ACR	DRAWN JLTF	SCALE AS SHOWN
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	L-10



DISTANCE FROM BASELINE

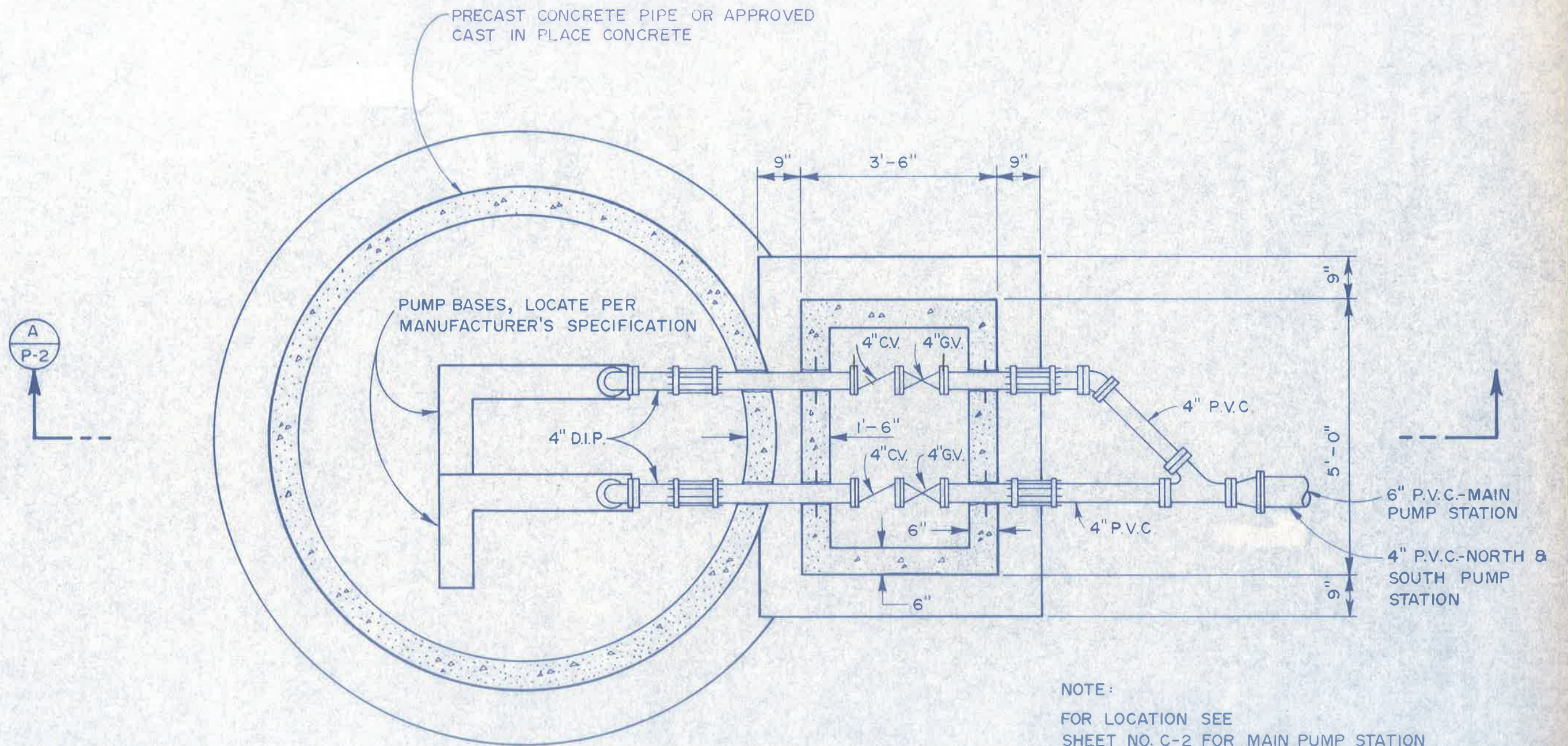
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

LAGOON CROSS SECTIONS



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN JLTF	SCALE AS SHOWN
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	L-11



A
TYP PLAN



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



CREAMER & NOBLE ENGINEERS

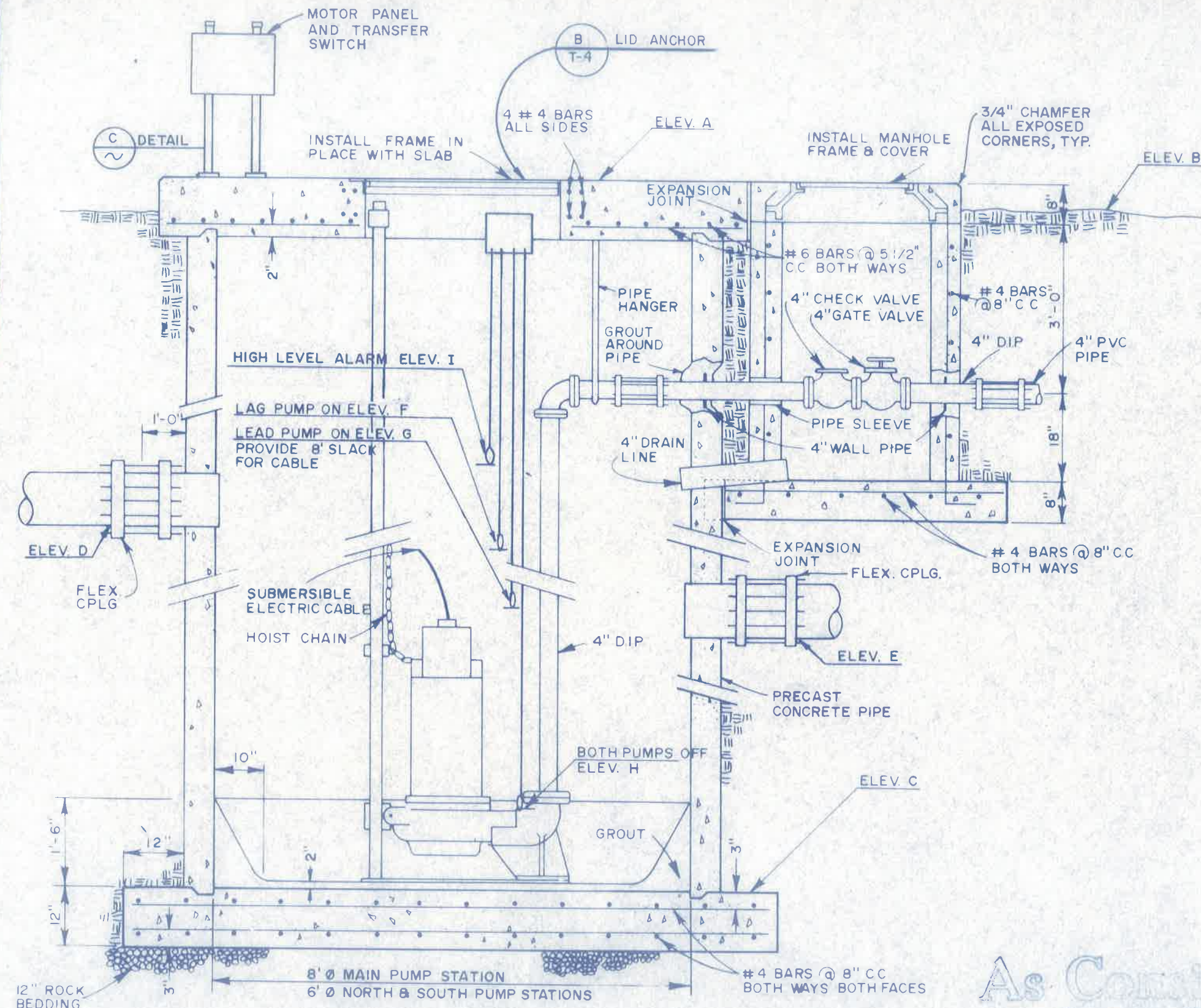
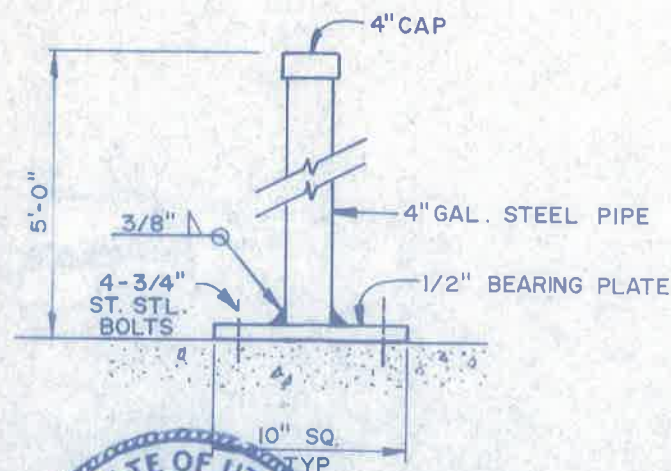
DESIGNED ACR	CHECKED KRN	DRAWN HKS	SCALE NONE
APPROVED	DATE 10/81	PROJECT NO.	
REVISION	DATE	SHEET NO.	

07 82 As Constructed
Creamer & Noble
CONSULTING ENGINEERS

PUMP STATION				
DESCRIPTION	ELEV.	MAIN	NORTH COLLECTION	SOUTH COLLECTION
TOP SLAB	A	4584.50	4595.50	4593.50
EXISTING GROUND	B	4584.00	4595.00	4593.00
BOTTOM SLAB	C	4567.50	4576.50	4573.00
INVERT SEWER	D	4574.54	4583.67	4580.00
INVERT SEWER	E	—	4583.67	4580.00
LAG PUMP ON	F	4575.50	4584.50	4581.00
LEAD PUMP ON	G	4574.50	4583.50	4580.00
LOW WATER CUTOFF*	H	4568.50	4577.50	4574.00
HIGH LEVEL ALARM	I	4576.50	4585.50	4582.00

* LOCATE AS SHOWN OR AS RECOMMENDED BY PUMP MANUFACTURER

NOTE: BROOM FINISH CONCRETE SURFACES



A SECTION
TYP

As Constructed
Creamer & Noble
CONSULTING ENGINEERS
07 82

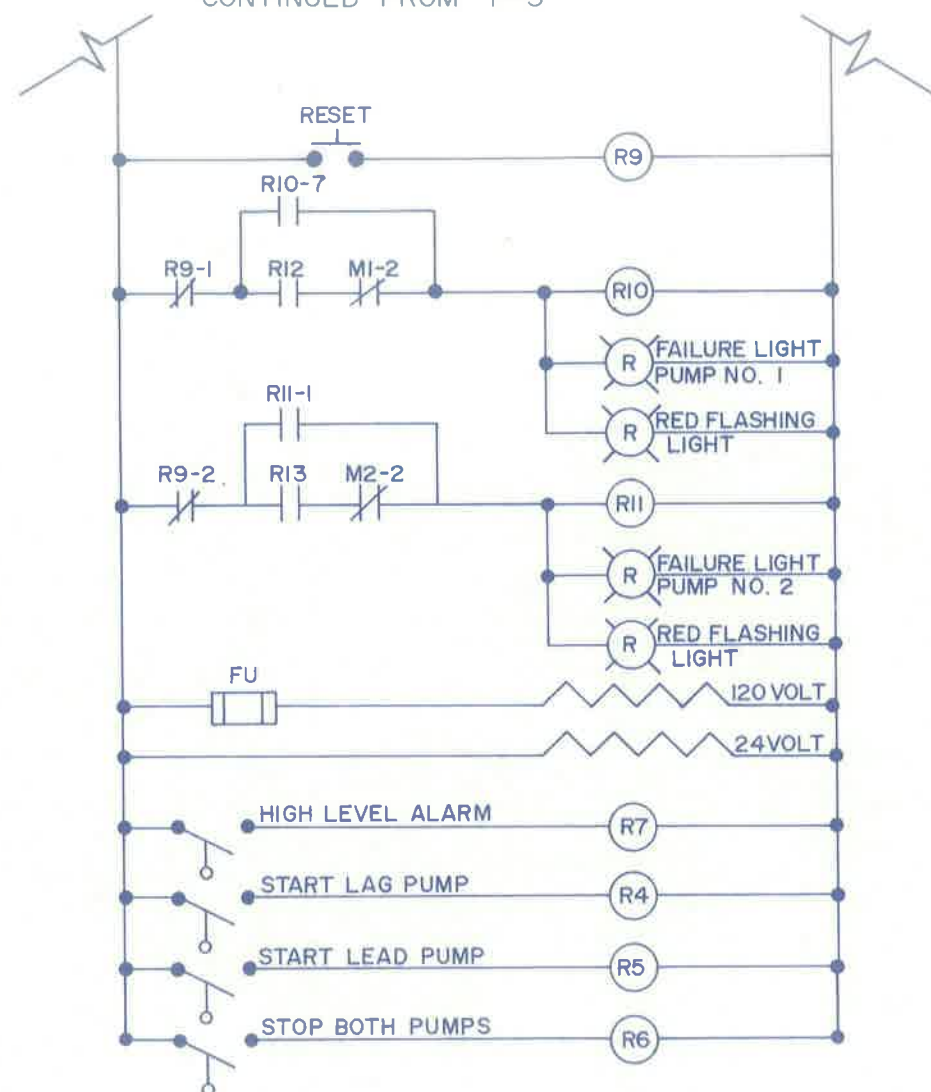


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



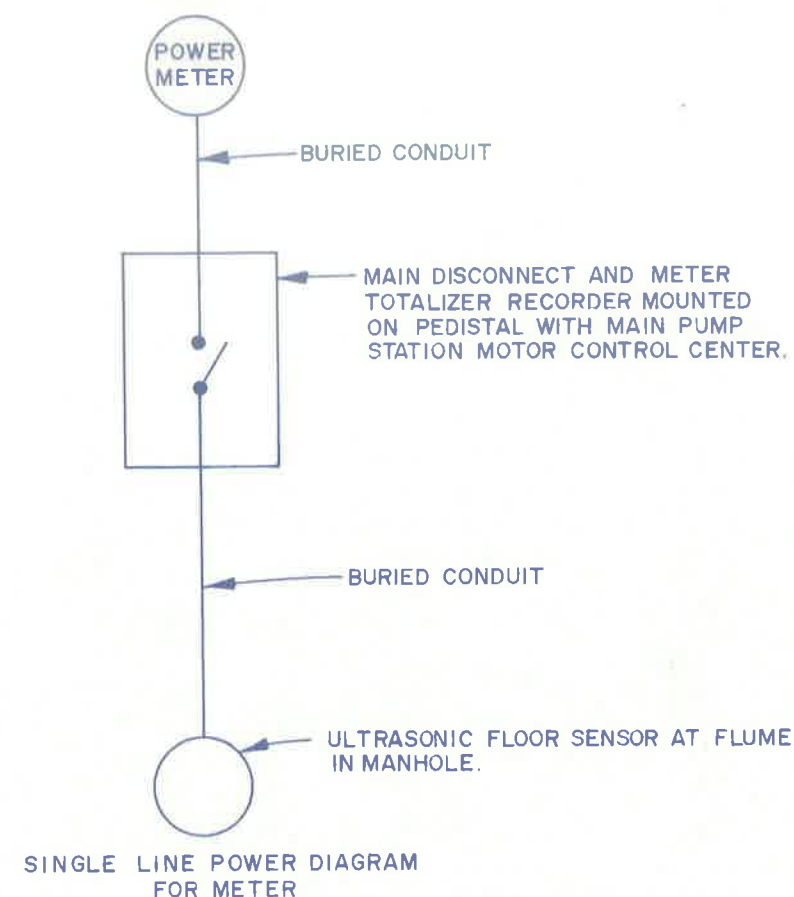
DESIGNED ACR	CHECKED CEW	DRAWN NSR	SCALE NONE
APPROVED	DATE 10/81	PROJECT NO.	
REVISION	DATE	SHEET NO.	

CONTINUED FROM P-3



CONTROL SCHEMATIC

120 VOLT SINGLE PHASE
POWER



GENERAL NOTE:

CONTRACTOR SHALL FURNISH AND INSTALL PER SPECIFICATIONS
ALL ELECTRICAL WORK BETWEEN THE METER AND THE LOAD
FOR METER AND PUMPS.

TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

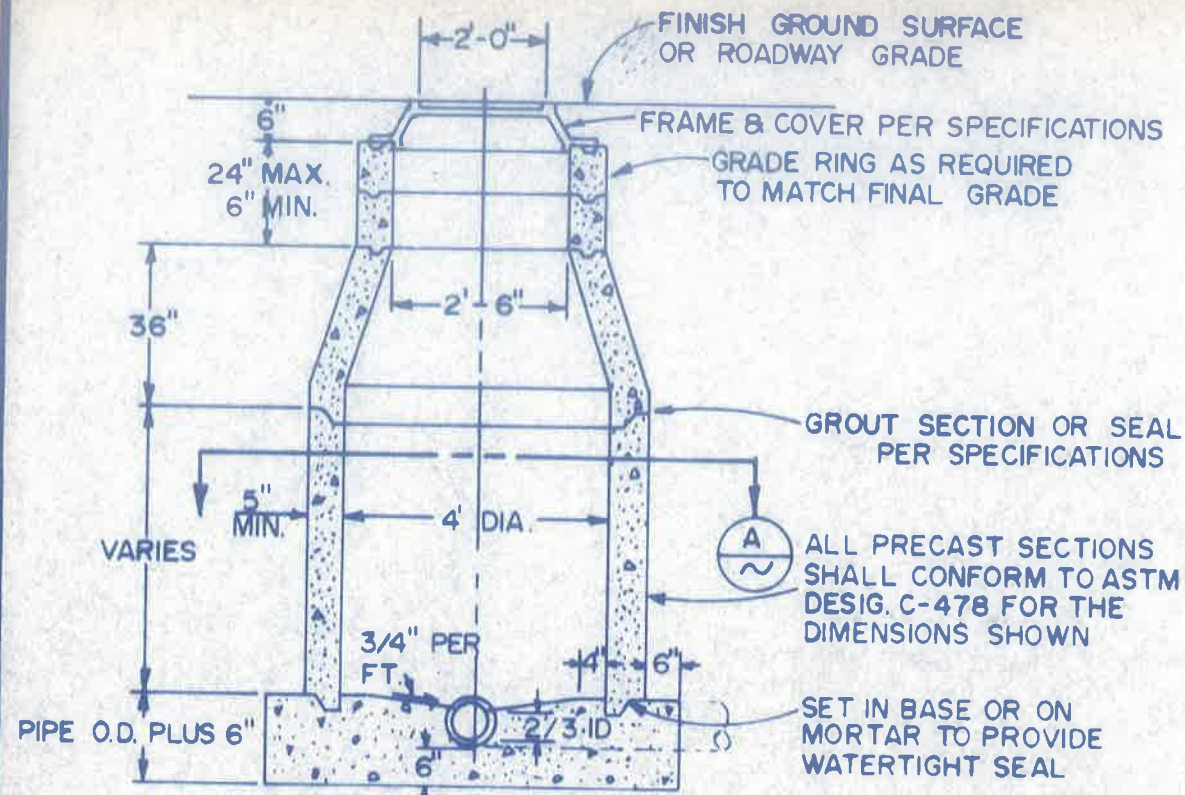
PUMP STATION & METERING ELECTRICAL



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

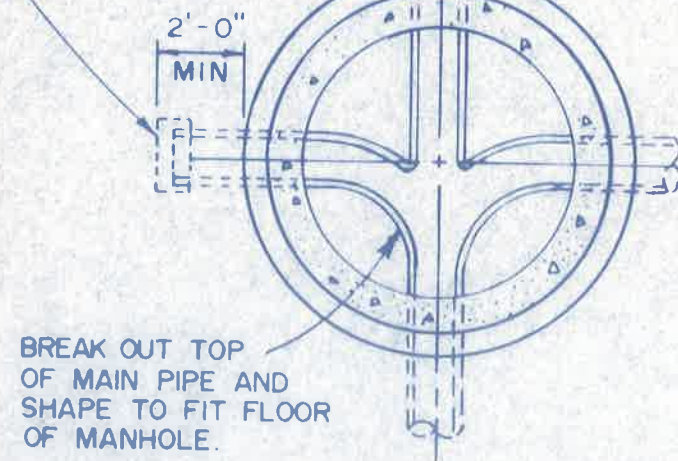
07 82
As Constructed
Creamer & Noble
CONSULTING ENGINEERS

DESIGNED ACR	CHECKED CEW	DRAWN JS	SCALE NONE
APPROVED	DATE 10/81	PROJECT NO.	
REVISION	DATE	SHEET NO. P-4	

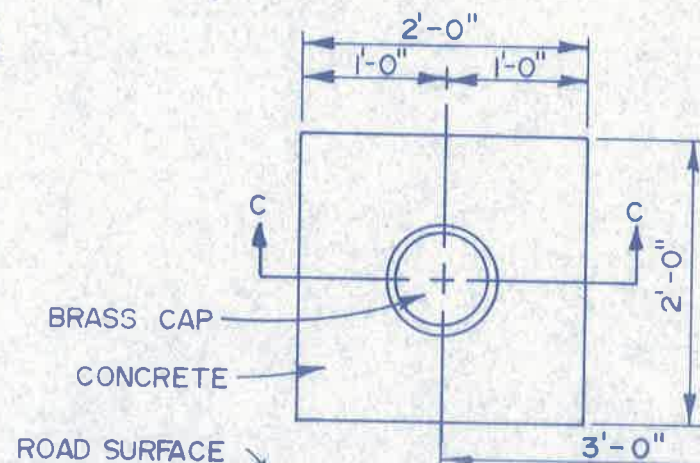


MH TYP. SEWER MANHOLE

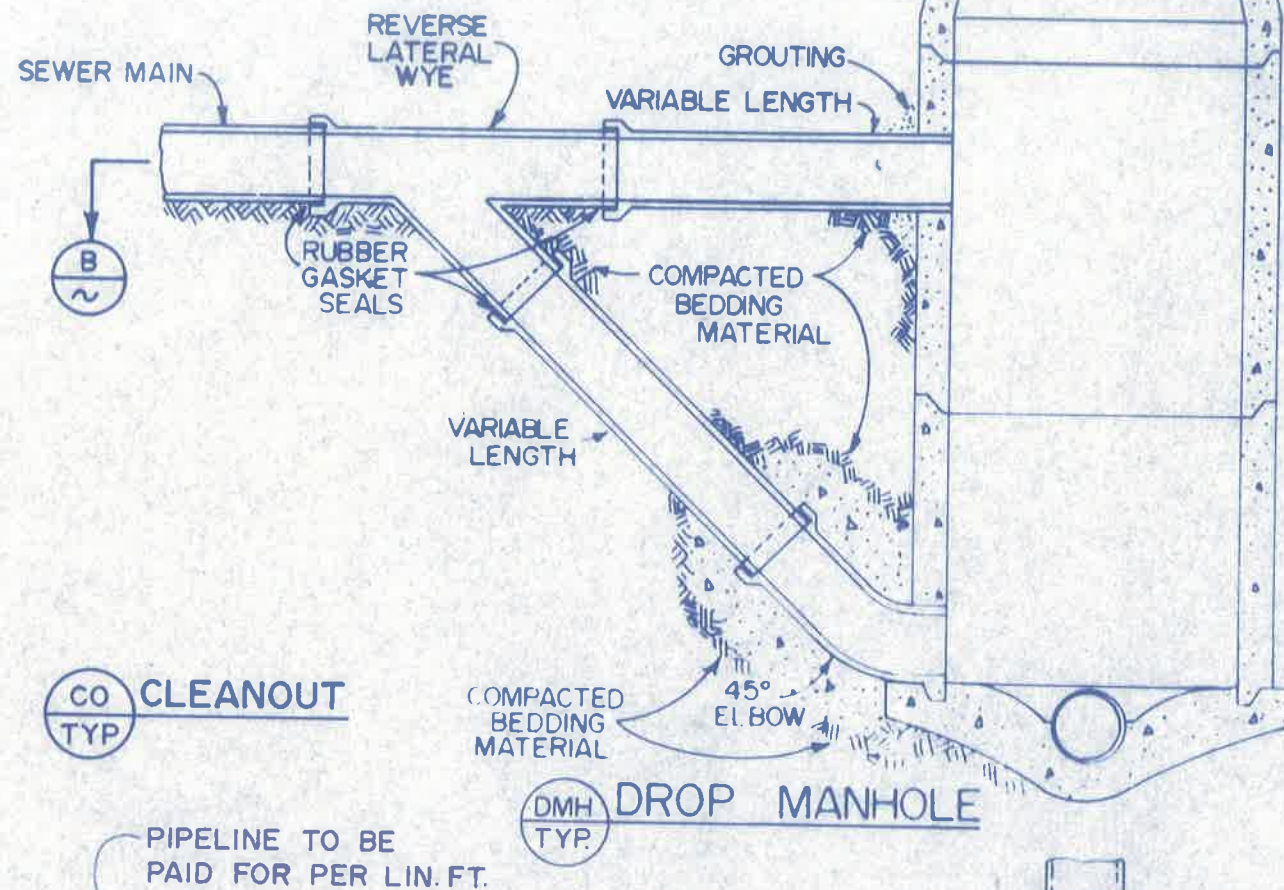
SEWER LINE STUB WITH WATER-TIGHT CAP WHERE INDICATED



A SECTION



C SECTION



B SECTION

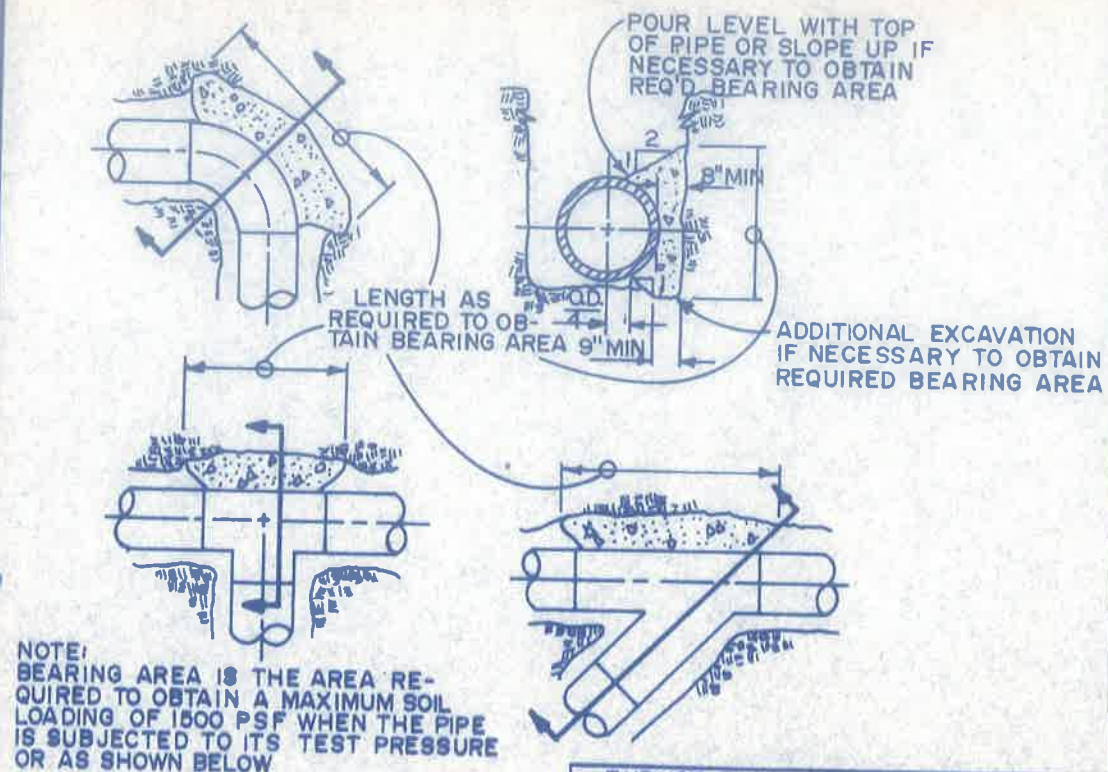


TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES



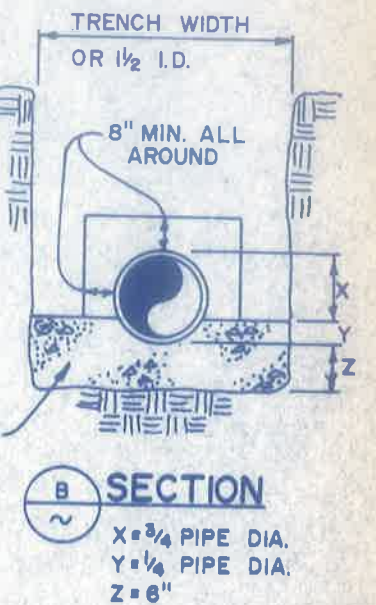
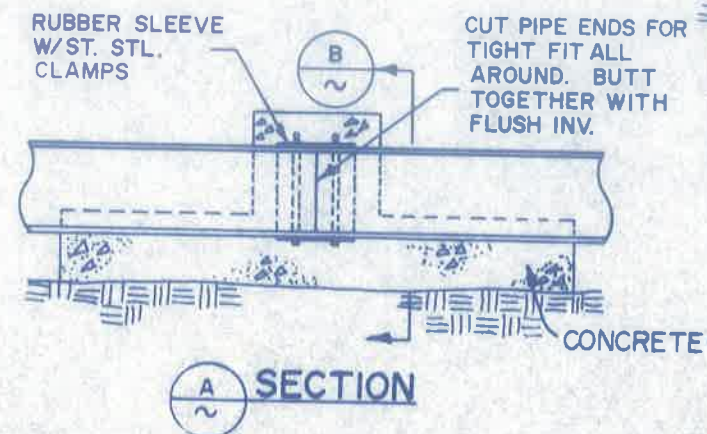
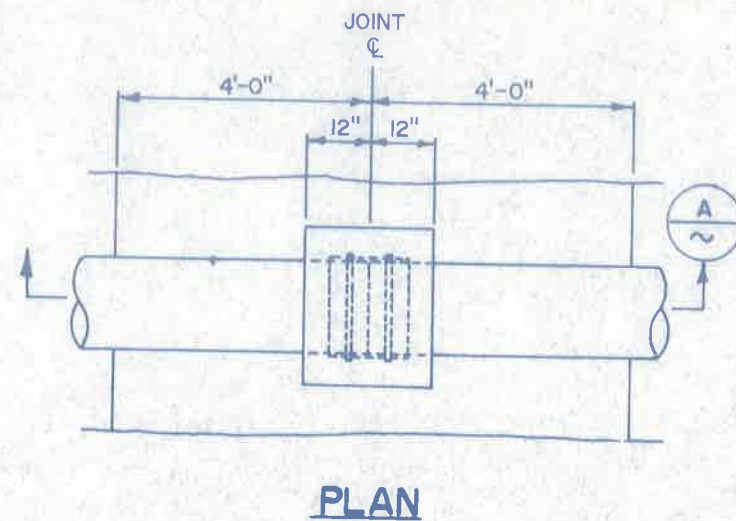
DESIGNED ACR	CHECKED CEW	DRAWN AKB	SCALE NONE
APPROVED	DATE 9/81	PROJECT NO.	

As Constructed
07 82
CREAMER & NOBLE
CONSULTING ENGINEERS



PB PIPE BLOCKING

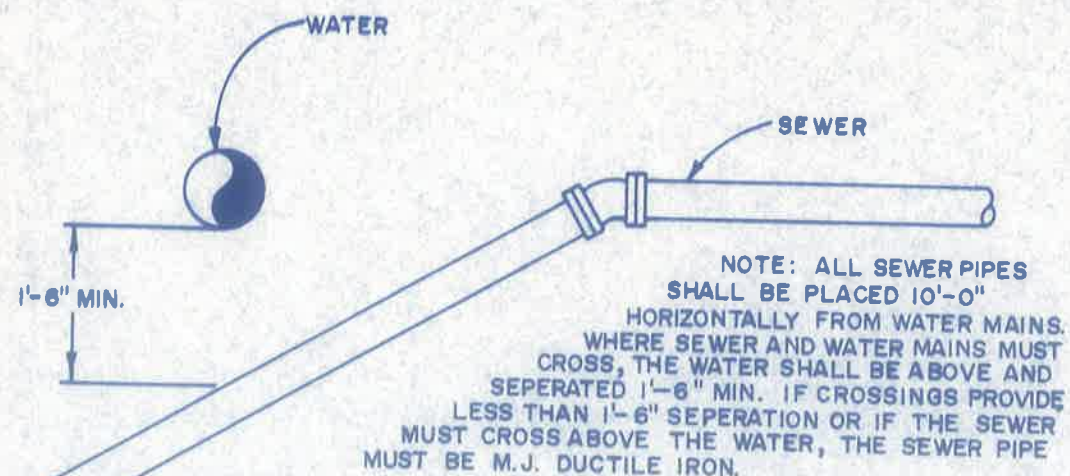
PIPE SIZE	THRUST BLOCK BEARING AREA IN SQ. FT.					
	TEE	90°	45°	22 1/2°	CROSS	PLUG
4"	1	1	1	1	1	1
6"	3	3	2	2	2	3
8"	4	6	3	2	3	4
10"	6	8	5	3	3	6
12"	9	12	6	3	4.5	9
16"	15	21	12	6	7	15



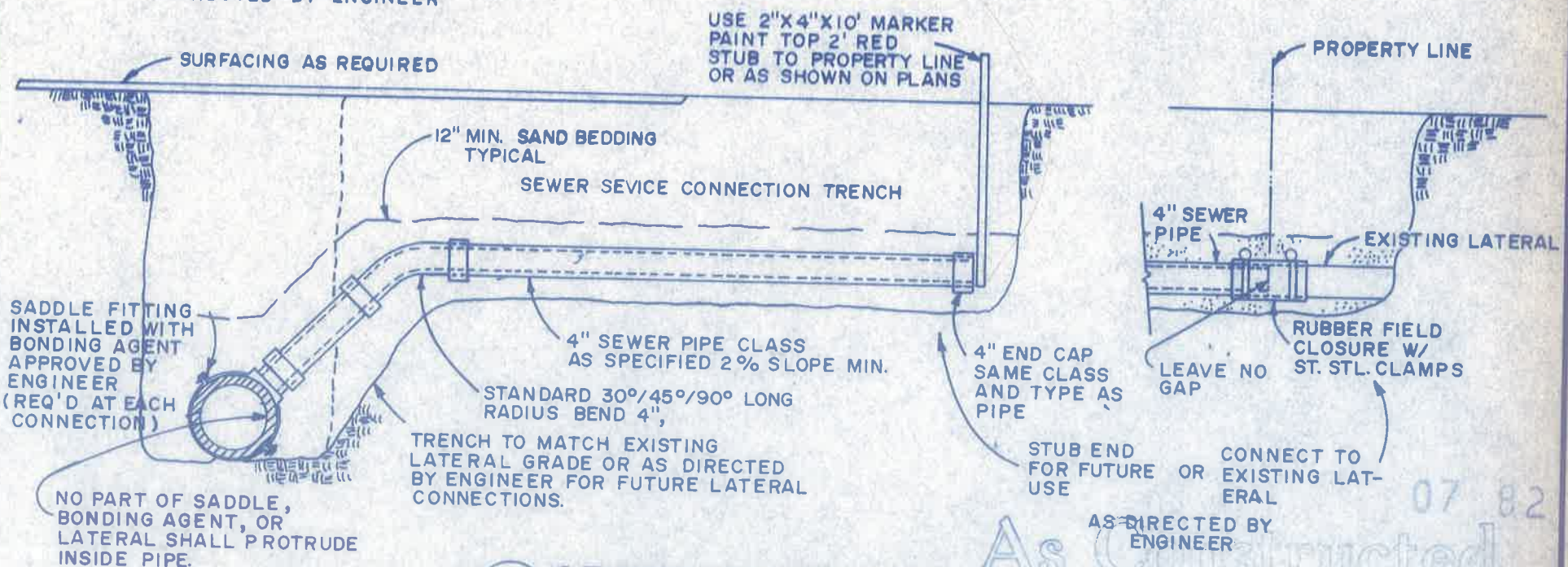
FC FIELD CLOSURE

NOTE: FIELD CLOSURE SHOULD CONFORM TO THIS DETAIL & SHALL BE USED ONLY WHERE NECESSARY & APPROVED BY ENGINEER.

NOTE: SEWER LATERALS TO BE INSTALLED WHERE SHOWN ON PLANS OR DIRECTED BY ENGINEER



SEWER/WATER CROSSING



SC SEWER CONNECTION



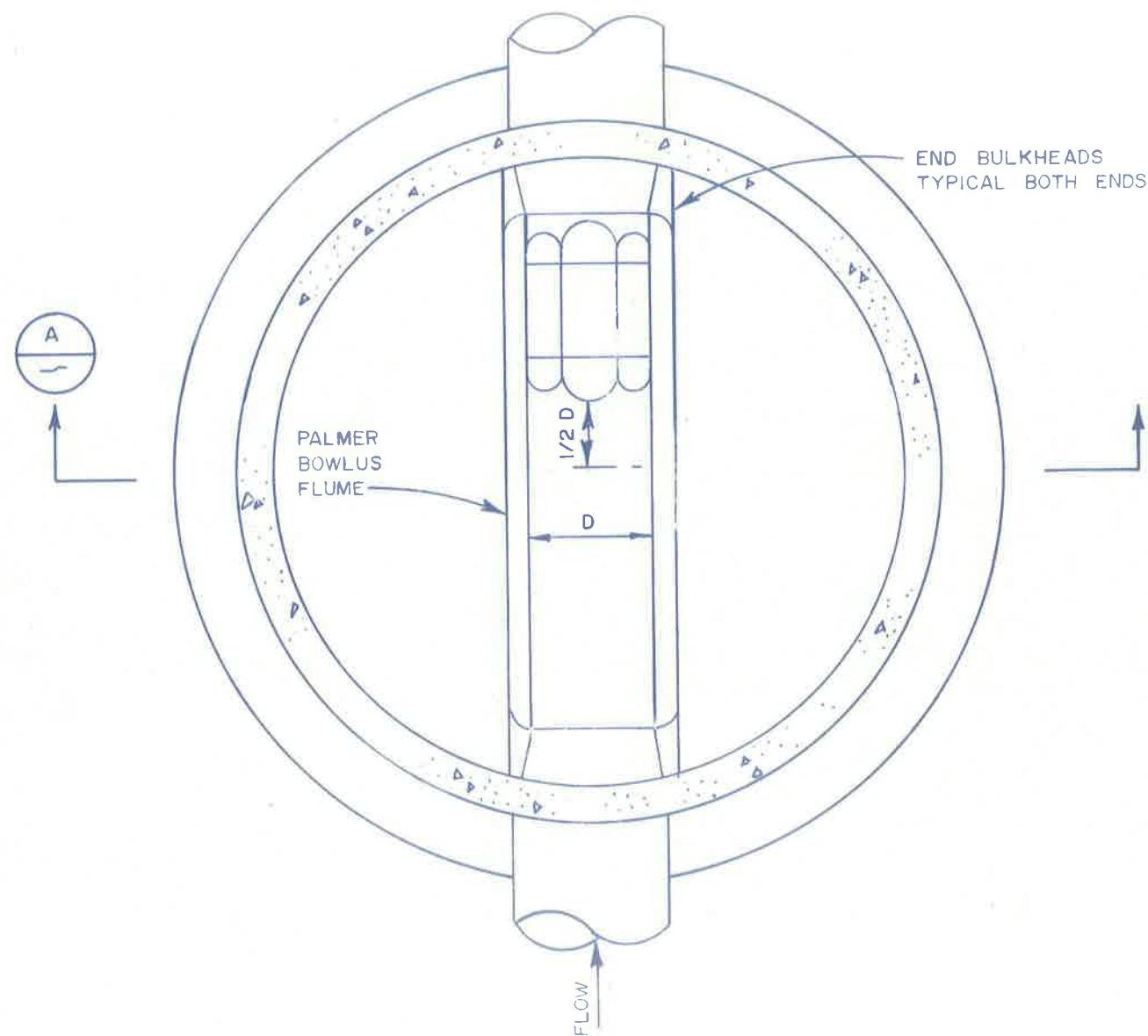
**TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES**

PIPE CONNECTION DETAILS

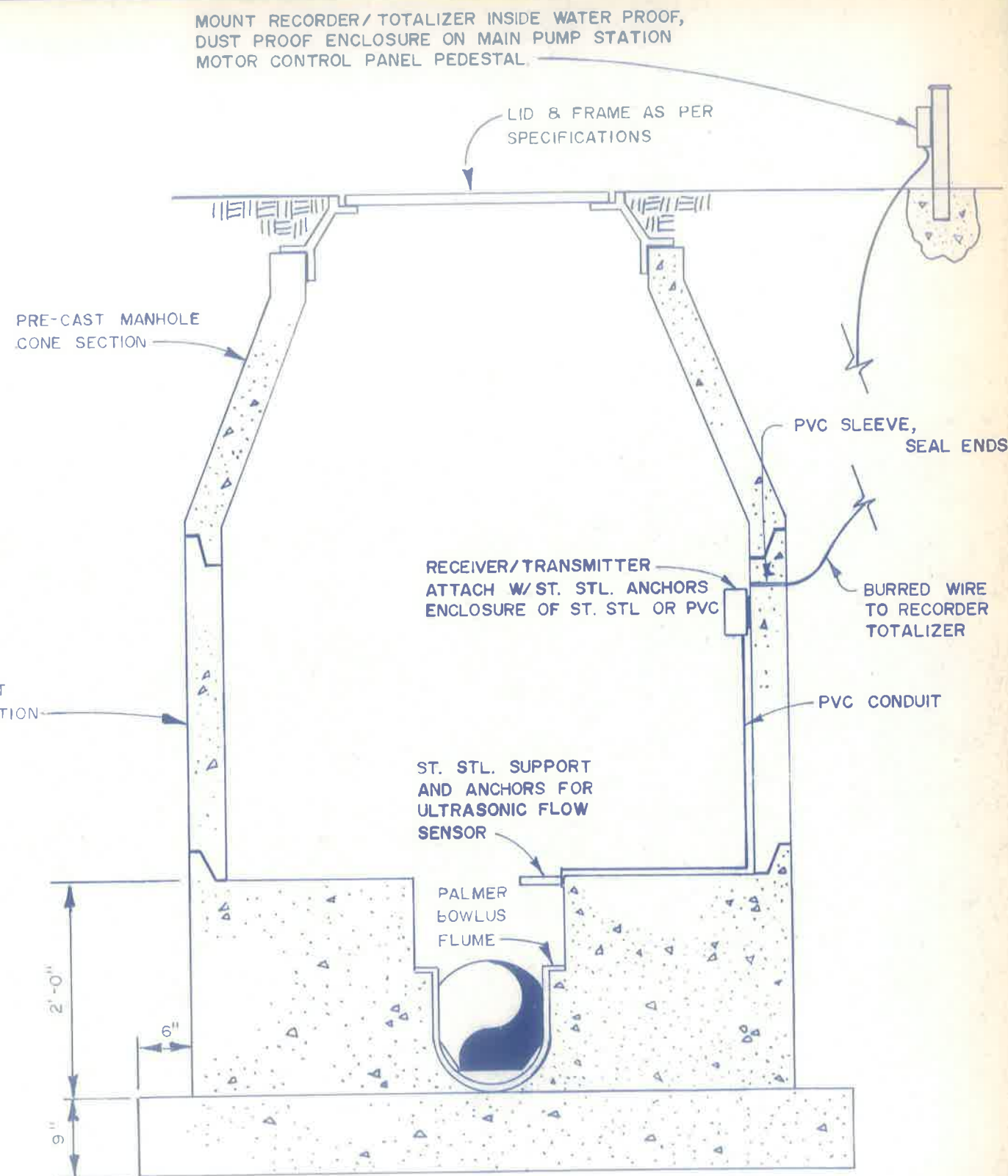


CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED	CHECKED	DRAWN	SCALE
ACR	CEW	JS	NONE
APPROVED	DATE	PROJECT NO.	
	9/81		
REVISION	DATE	SHEET NO.	



M PLAN-METERING STATION
C-2



A SECTION



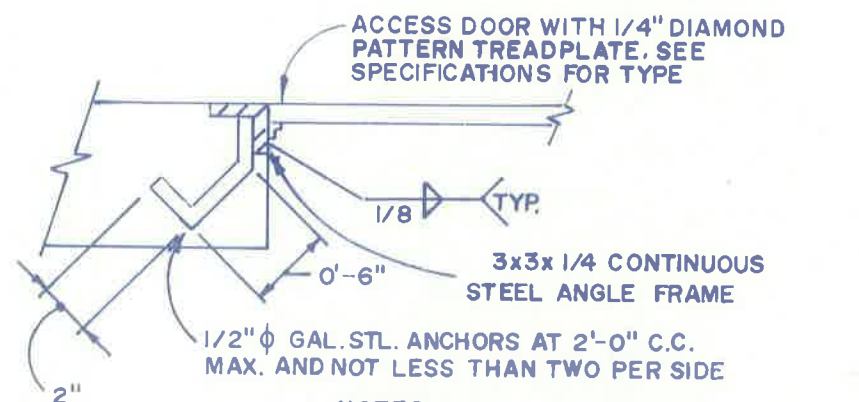
TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES
METERING STATION

07 82
As *Creamer & Noble*
CONSULTING ENGINEERS



CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED RSC	CHECKED ACR	DRAWN RH	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	T-3

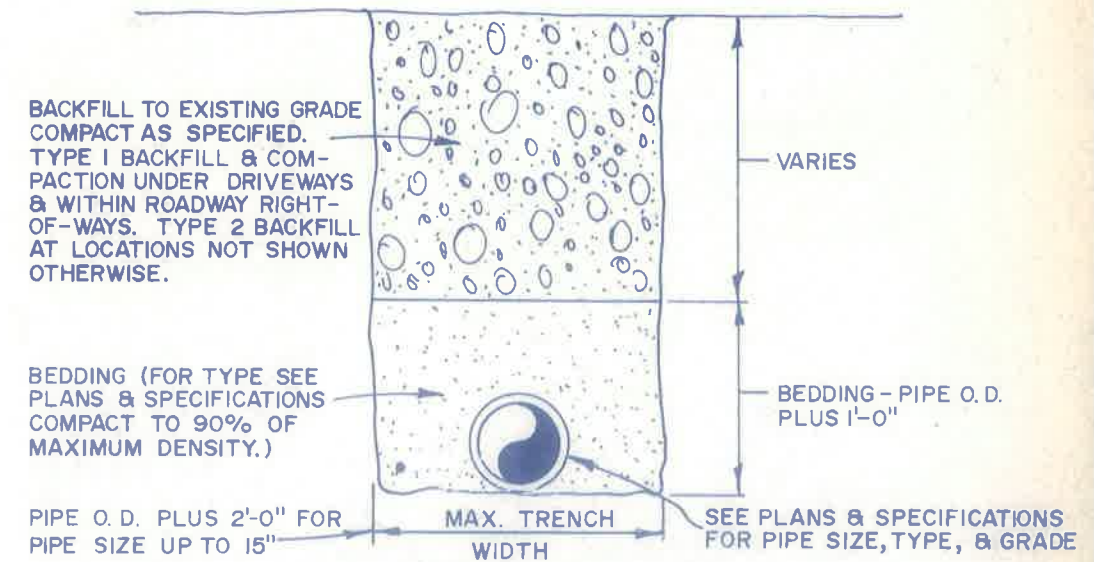


NOTES:

1. CONTRACTOR SHALL NOT RACK OR TWIST FRAME WHEN SETTING.
2. FRAME SHALL BE INSTALLED FLUSH WITH CONCRETE.
3. OTHER DOOR DETAILS AND OPERATIONS SHALL BE AS SPECIFIED OR AS RECOMMENDED BY THE MANUFACTURER.

B
P-2 STEEL DOOR

As Constructed
Creamer & Noble
CONSULTING ENGINEERS



TD
TYP TRENCH DETAIL BEDDING



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

DETAILS



DESIGNED	CHECKED ACR	DRAWN AKB	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. T-4	

1. 1/8" MIN. CLEANCE BETWEEN ENDS OF GRATING AND INSIDE FACE FRAME.
2. ANCHORS TO BE PLACED 2'-0" O.C. MAX. AND NOT LESS THAN 2 PER SIDE.
3. COAT ALL ALUMINUM, IN CONTACT W/CEMENT, IN ZINC CHROMATE PRIMER

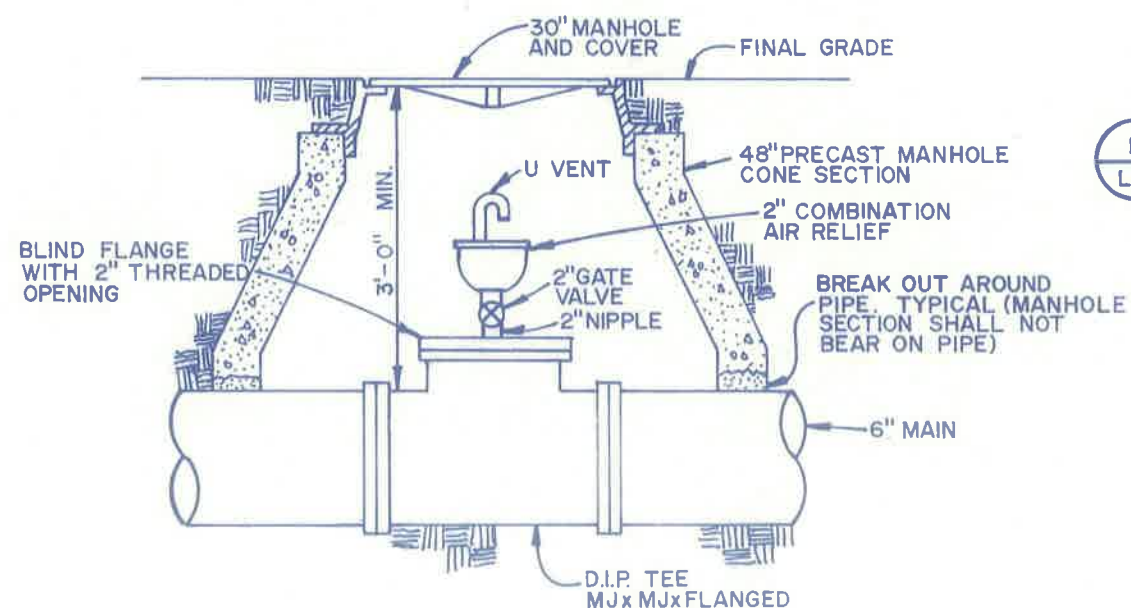
GRATING

5/8" Ø ST. STL. ANCHOR BOLTS

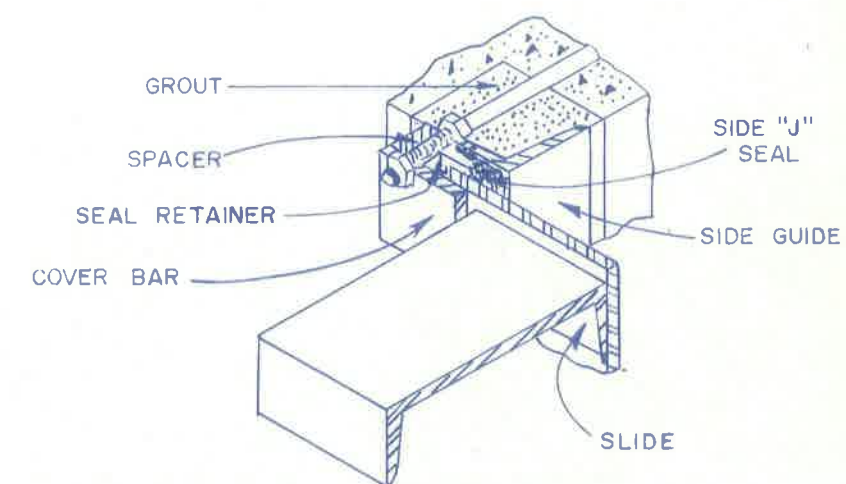
(2) 4" x 3-1/2" x 1/2"

S 6 x 4.3 x 2'-6"
GRATING SUPPORT BEAM

4"



 DETAIL - SUPPORT BEAM



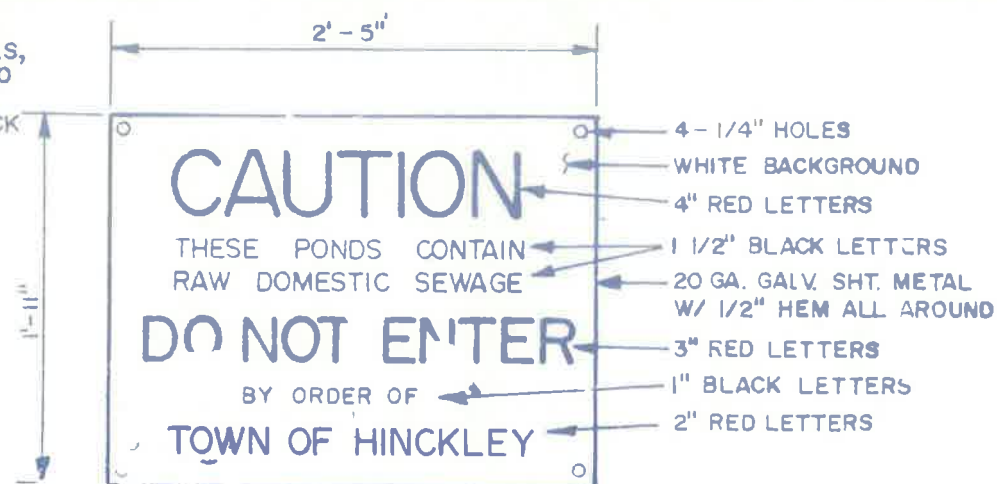
A cross-sectional diagram of a window assembly. It shows a window frame (labeled 'FRAME') with a textured interior surface. A 'SEAL RETAINER' is attached to the frame. A 'SLIDE' is shown moving along the seal retainer. A 'BOTTOM "J" SEAL' is located at the bottom of the frame. 'GROUT' is shown filling the space between the frame and the wall.



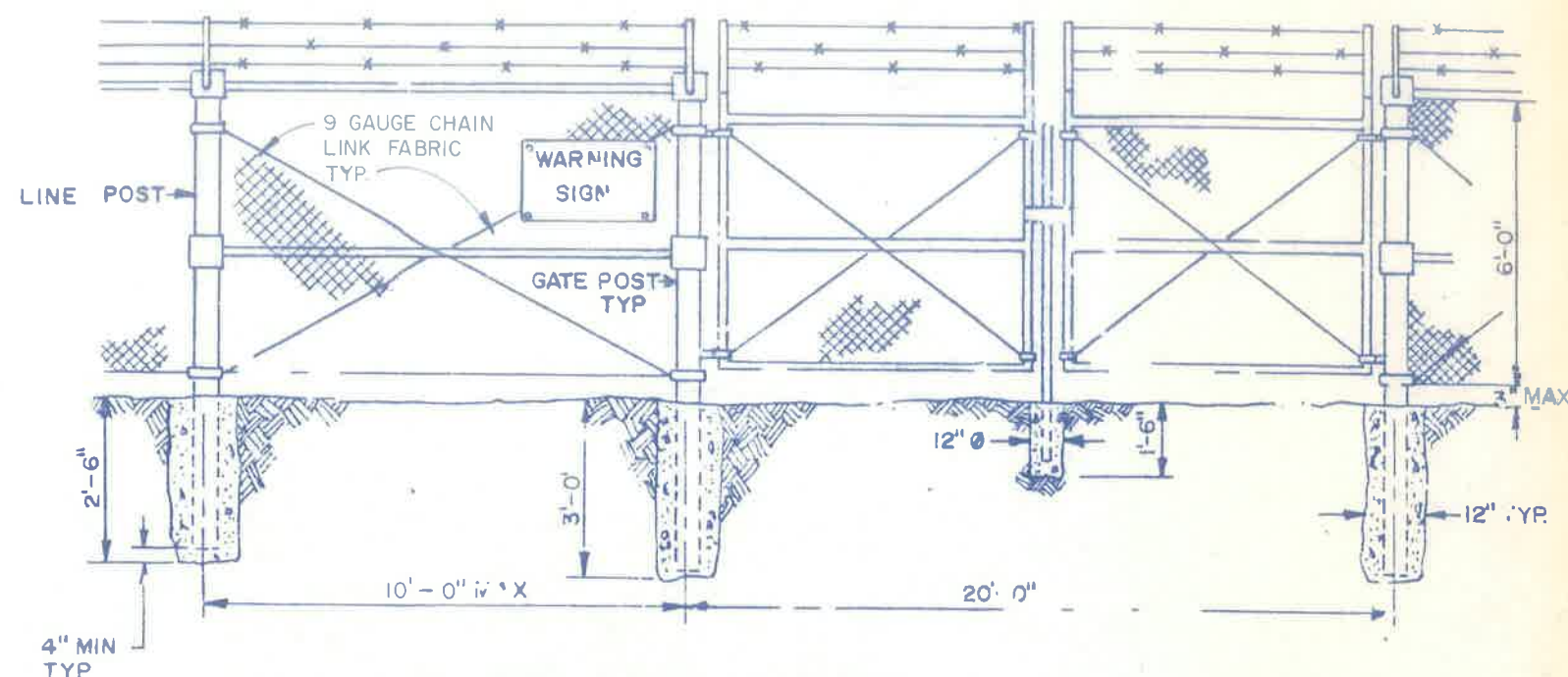
CREAMER & NOBLE ENGINEERS
ST. GEORGE, UTAH

DESIGNED R S C	CHECKED A C R	DRAWN L O B	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO. T-5	

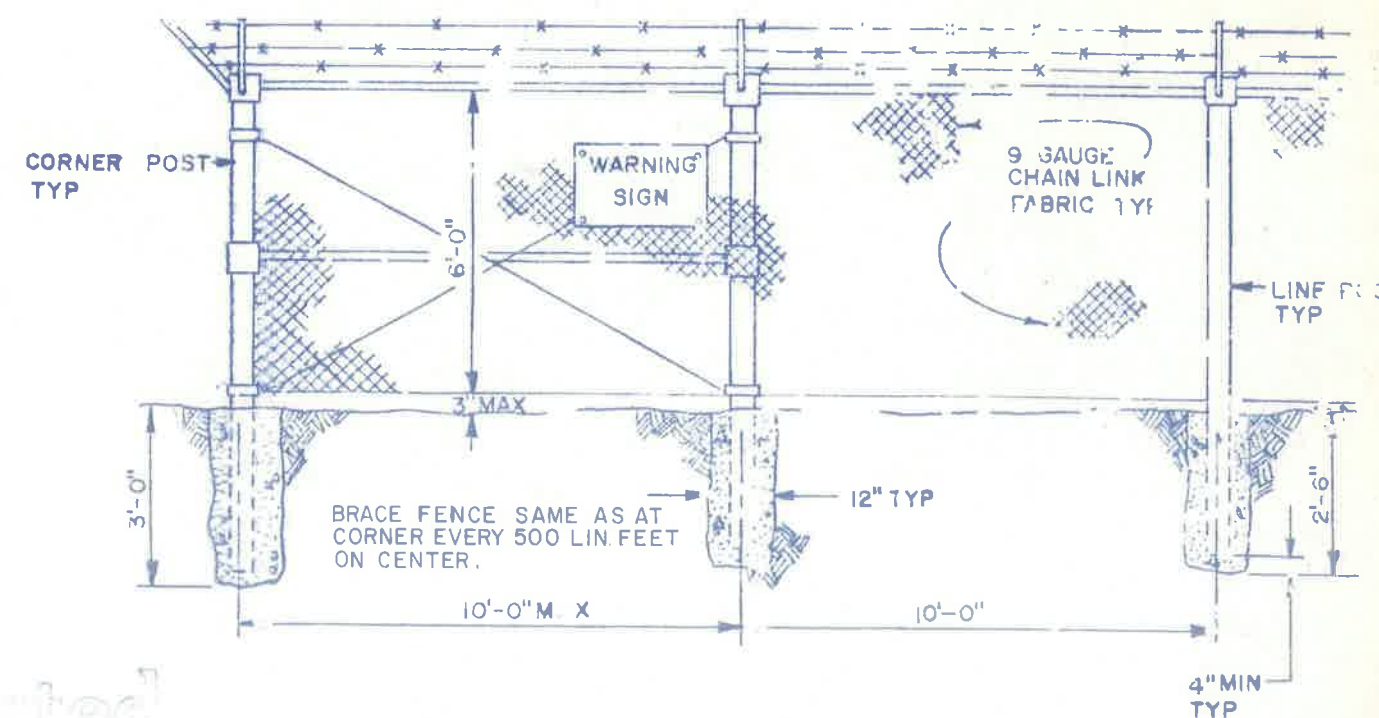
NOTE: LOCATE AT GATES,
CORNERS, AND AT 500
FEET ON CENTER ON
CHAIN LINK AND STOCK
FENCES.



LAGOON AREA WARNING SIGN



A GATE DETAIL



B FENCE DETAIL



TOWN OF HINCKLEY
WASTEWATER TREATMENT FACILITIES

DETAILS

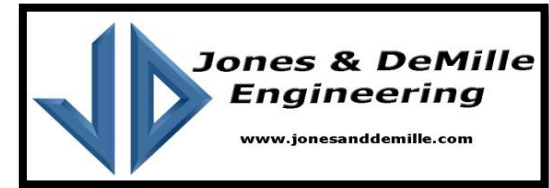


DESIGNED RSC	CHECKED ACR	DRAWN AKB	SCALE NONE
APPROVED	DATE	PROJECT NO.	
REVISION	DATE	SHEET NO.	T-6

APPENDIX B. FUTURE SEWER CONNECTIONS EXHIBIT

APPENDIX C. ENGINEER'S OPINION OF PROBABLE COST

**Hinckley Town
Sanitary Sewer Master Plan
May 27, 2024
By: Cody Peck**



PRELIMINARY OPINION OF PROBABLE COST

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Sewer Treatment - Mechanical Treatment					
1	Mobilization	1	L.S.	\$ 270,000.00	\$ 270,000.00
2	8-inch PVC Sewer Pipe	500	L.F.	\$ 50.00	\$ 25,000.00
3	48-in Diameter Manhole with Ring andCover	4	Each	\$ 10,000.00	\$ 40,000.00
4	Site Preperation	1	L.S.	\$ 30,000.00	\$ 30,000.00
5	Sanitaire In-ground SBR System Equipment	1	L.S.	\$ 2,400,000.00	\$ 2,400,000.00
	(Includes blowers, aeration equipment, SCADA, belt filter press, UV disinfection, screening & process equipment)				
6	SBR Tanks & Sludge Holding Tnak - Reinforced Concrete	1	L.S.	\$ 353,000.00	\$ 353,000.00
7	Site Piping	1	L.S.	\$ 48,000.00	\$ 48,000.00
8	Inlet Structure/ Wet Well - Reinforced Concrete	1	L.S.	\$ 31,000.00	\$ 31,000.00
9	6-foot Chain Link Fence with Barbed Wire	800	L.F.	\$ 35.00	\$ 28,000.00
10	Chain Lnk Gates - 2 ach @ 16-feet & 2 each @ 3-feet	1	L.S.	\$ 5,300.00	\$ 5,300.00
11	Masonry Building for Treatment	1	L.S.	\$ 140,000.00	\$ 140,000.00
12	Lift Station	1	L.S.	\$ 273,000.00	\$ 273,000.00
13	Force Main- 4-inch PVC with Valves, Fittings, & Air Release Valves	3000	L.F.	\$ 30.00	\$ 90,000.00
Miscellaneous					
15	Maintenance Facility	1	L.S.	\$ 234,000.00	\$ 234,000.00
16	Construction Staking	1	L.S.	\$ 50,000.00	\$ 50,000.00
17	Materials Testing	1	L.S.	\$ 100,000.00	\$ 100,000.00
SUBTOTAL					\$ 4,117,000.00
Construction Contingency (20%)		1	LUMP		\$ 824,000.00
TOTAL PROBABLE CONSTRUCTION COST					\$ 4,941,000.00
	MISCELLANEOUS EXPENSES				
1	Preconstruction Engineering	1	LUMP	\$ 455,000.00	\$ 455,000.00
2	Permitting/ Licenses	1	LUMP	\$ 53,000.00	\$ 53,000.00
3	Admin(Legal Fees,Financial)	1	LUMP	\$ 20,000.00	\$ 20,000.00
4	Survey	1	LUMP	\$ 13,000.00	\$ 13,000.00
5	Geotechnical Report	1	LUMP	\$ 45,000.00	\$ 45,000.00
6	Testing, Special Inspections, & Construction Engineering	1	LUMP	\$ 230,000.00	\$ 230,000.00
TOTAL PROBABLE PROJECT COST					\$ 5,757,000.00

In providing estimates of probable construction cost, 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 estimates of probable construction costs 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 estimate of probable construction cost.

Hinckley Town
Sanitary Sewer Master Plan
June 19, 2024
By: Cody Peck

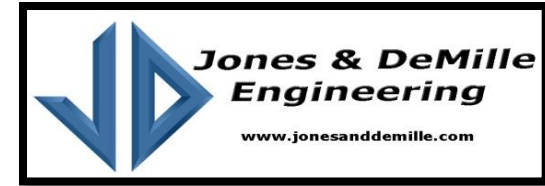


PRELIMINARY OPINION OF PROBABLE COST - CONSTRUCT TWO SMALLER PONDS (4.79 ACRES)

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
LAGOON IMPROVEMENTS					
1	Mobilization	1	L.S.	\$ 253,000.00	\$ 253,000.00
2	Lagoon Site Demolition	1	L.S.	\$ 20,000.00	\$ 20,000.00
3	Remove Chain Link Fence	4620	L.F.	\$ 5.00	\$ 23,100.00
4	Clearing & Grubbing	20000	S.Y.	\$ 9.00	\$ 180,000.00
5	Dewatering Lagoon 1	1	L.S.	\$ 15,000.00	\$ 15,000.00
6	Lagoon Site Excavation	78,000	C.Y.	\$ 8.00	\$ 624,000.00
7	Sludge and Sediment Removal	20,570	C.Y.	\$ 7.00	\$ 143,990.00
8	Clay Liner	24,600	C.Y.	\$ 24.00	\$ 590,400.00
9	Soil Cover	9,200	C.Y.	\$ 7.00	\$ 64,400.00
10	Compacted Embankment	14,060	C.Y.	\$ 7.00	\$ 98,420.00
11	Uncompacted Embankment	3,088	C.Y.	\$ 4.00	\$ 12,350.00
12	Import Fill	7,100	C.Y.	\$ 12.00	\$ 85,200.00
13	Onsite Riprap (D50 = 8")	4,750	C.Y.	\$ 30.00	\$ 142,500.00
14	Import Riprap (D50 = 8")	0	C.Y.	\$ 55.00	\$ -
15	Untreated Base Course	680	C.Y.	\$ 52.00	\$ 35,360.00
16	Lagoon Transfer Station	1	L.S.	\$ 62,000.00	\$ 62,000.00
17	Seeding	4	Acre	\$ 5,000.00	\$ 20,000.00
18	Meter and Meter Vault	1	L.S.	\$ 40,000.00	\$ 40,000.00
19	Sanitary Sewer Pipe - Force main extention to additional cell	400	L.F.	\$ 50.00	\$ 20,000.00
20	Primary Lagoon Inlet Structure	2	Each	\$ 11,000.00	\$ 22,000.00
21	Secondary Lagoon Inlet Structure	2	Each	\$ 10,000.00	\$ 20,000.00
22	8" PVC Pipe	200	L.F.	\$ 50.00	\$ 10,000.00
23	10" PVC Pipe	100	L.F.	\$ 75.00	\$ 7,500.00
24	12" PVC Pipe	100	L.F.	\$ 85.00	\$ 8,500.00
25	Water Level Indicator	2	Each	\$ 2,500.00	\$ 5,000.00
26	6' Chain Link Fence with Barbed Wire	4620	L.F.	\$ 45.00	\$ 207,900.00
27	Construction Staking	1	L.S.	\$ 40,000.00	\$ 40,000.00
28	Environmental	1	L.S.	\$ 15,000.00	\$ 15,000.00
29	Topographic Survey	1	L.S.	\$ 12,000.00	\$ 12,000.00
SUBTOTAL					\$ 2,778,000.00
Construction Contingency (20%)		1	LUMP		\$ 417,000.00
TOTAL PROBABLE CONSTRUCTION COST					\$ 3,195,000.00
MISCELLANEOUS EXPENSES					
1	Preconstruction Engineering	1	LUMP	\$ 200,000.00	\$ 200,000.00
2	Admin(Legal Fees,Financial)	1	LUMP	\$ 10,000.00	\$ 10,000.00
3	Geotechnical Report	1	LUMP	\$ 40,000.00	\$ 40,000.00
4	Testing, Special Inspections, & Construction Engineering	1	LUMP	\$ 200,000.00	\$ 200,000.00
TOTAL PROBABLE PROJECT COST					\$ 3,645,000.00

In providing estimates of probable construction cost, 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 estimates of probable construction costs 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 estimate of probable construction cost.

Hinckley Town
Sanitary Sewer Master Plan
June 19, 2024
By: Cody Peck



Loan/Grant Ratio	100% Loan		75/25		70/30		60/40		50/50	
Estimated Project Cost	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000
City Cash Contribution	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000
In-Kind (Other)										
CIB Funded Total	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000
% Grant	0%	0%	25%	25%	30%	30%	40%	40%	50%	50%
% Loan	100%	100%	75%	75%	70%	70%	60%	60%	50%	50%
CIB Grant Amount	\$ -	\$ -	\$ 911,250	\$ 886,250	\$ 1,093,500	\$ 1,063,500	\$ 1,458,000	\$ 1,418,000	\$ 1,822,500	\$ 1,772,500
CIB Loan Amount	\$ 3,645,000	\$ 3,545,000	\$ 2,733,750	\$ 2,658,750	\$ 2,551,500	\$ 2,481,500	\$ 2,187,000	\$ 2,127,000	\$ 1,822,500	\$ 1,772,500
Interest Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Loan Term (yrs)	30	30	30	30	30	30	30	30	30	30
Yearly Payment	(\$174,150)	(\$169,372)	(\$130,612)	(\$127,029)	(\$121,905)	(\$118,560)	(\$104,490)	(\$101,623)	(\$87,075)	(\$84,686)

Loan/Grant Percentage	100% Loan		75/25		70/30		60/40		50/50	
Estimated Project Cost	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000	\$ 3,645,000
City Cash Contribution	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000
CIB Funded Total	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000	\$ 3,645,000	\$ 3,545,000
% Grant	0%	0%	25%	25%	30%	30%	40%	40%	50%	50%
% Loan	100%	100%	75%	75%	70%	70%	60%	60%	50%	50%
CIB Grant Amount	\$ -	\$ -	\$ 911,250	\$ 886,250	\$ 1,093,500	\$ 1,063,500	\$ 1,458,000	\$ 1,418,000	\$ 1,822,500	\$ 1,772,500
CIB Loan Amount	\$ 3,645,000	\$ 3,545,000	\$ 2,733,750	\$ 2,658,750	\$ 2,551,500	\$ 2,481,500	\$ 2,187,000	\$ 2,127,000	\$ 1,822,500	\$ 1,772,500
Interest Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Loan Term (yrs)	30	30	30	30	30	30	30	30	30	30
Yearly Payment	(\$141,237)	(\$137,362)	(\$105,928)	(\$103,022)	(\$98,866)	(\$96,153)	(\$84,742)	(\$82,417)	(\$70,618)	(\$68,681)

Hinckley Town
Sanitary Sewer Master Plan
June 19, 2024
By: Cody Peck

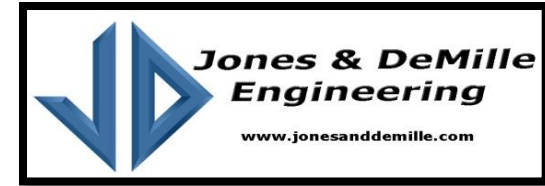


PRELIMINARY OPINION OF PROBABLE COST - CONSTRUCT TWO PONDS (7.17 ACRES & 2.8 ACRES)

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
LAGOON IMPROVEMENTS					
1	Mobilization	1	L.S.	\$ 271,000.00	\$ 271,000.00
2	Lagoon Site Demolition	1	L.S.	\$ 20,000.00	\$ 20,000.00
3	Remove Chain Link Fence	4620	L.F.	\$ 5.00	\$ 23,100.00
4	Clearing & Grubbing	20,000	S.Y.	\$ 9.00	\$ 180,000.00
5	Dewatering Lagoon 1	1	L.S.	\$ 15,000.00	\$ 15,000.00
6	Lagoon Site Excavation	80,400	C.Y.	\$ 8.00	\$ 643,200.00
7	Sludge and Sediment Removal	20,570	C.Y.	\$ 7.00	\$ 143,990.00
8	Clay Liner	25,500	C.Y.	\$ 24.00	\$ 612,000.00
9	Soil Cover	9,600	C.Y.	\$ 7.00	\$ 67,200.00
10	Compacted Embankment	14,100	C.Y.	\$ 7.00	\$ 98,700.00
11	Uncompacted Embankment	3,088	C.Y.	\$ 4.00	\$ 12,350.00
12	Import Fill	7,000	C.Y.	\$ 12.00	\$ 84,000.00
13	Onsite Riprap (D50 = 8")	4,750	C.Y.	\$ 30.00	\$ 142,500.00
14	Import Riprap (D50 = 8")	0	C.Y.	\$ 55.00	\$ -
15	Untreated Base Course	680	C.Y.	\$ 52.00	\$ 35,360.00
16	Lagoon Transfer Station	2	L.S.	\$ 62,000.00	\$ 124,000.00
17	Seeding	4	Acre	\$ 5,000.00	\$ 20,000.00
18	Meter and Meter Vault	1	L.S.	\$ 40,000.00	\$ 40,000.00
19	Sanitary Sewer Pipe - Force main extention to additional cell	760	L.F.	\$ 50.00	\$ 38,000.00
20	Primary Lagoon Inlet Structure	2	Each	\$ 11,000.00	\$ 22,000.00
21	Secondary Lagoon Inlet Structure	3	Each	\$ 10,000.00	\$ 30,000.00
22	8" PVC Pipe	900	L.F.	\$ 50.00	\$ 45,000.00
23	10" PVC Pipe	200	L.F.	\$ 75.00	\$ 15,000.00
24	12" PVC Pipe	150	L.F.	\$ 85.00	\$ 12,750.00
25	Water Level Indicator	3	Each	\$ 2,500.00	\$ 7,500.00
26	6' Chain Link Fence with Barbed Wire	4620	L.F.	\$ 45.00	\$ 207,900.00
27	Construction Staking	1	L.S.	\$ 40,000.00	\$ 40,000.00
28	Environmental	1	L.S.	\$ 15,000.00	\$ 15,000.00
29	Topographic Survey	1	L.S.	\$ 12,000.00	\$ 12,000.00
SUBTOTAL					\$ 2,978,000.00
Construction Contingency (20%)		1	LUMP		\$ 596,000.00
TOTAL PROBABLE CONSTRUCTION COST					\$ 3,574,000.00
MISCELLANEOUS EXPENSES					
1	Preconstruction Engineering	1	LUMP	\$ 200,000.00	\$ 225,000.00
2	Admin(Legal Fees,Financial)	1	LUMP	\$ 10,000.00	\$ 10,000.00
3	Geotechnical Report	1	LUMP	\$ 40,000.00	\$ 40,000.00
4	Testing, Special Inspections, & Construction Engineering	1	LUMP	\$ 200,000.00	\$ 225,000.00
TOTAL PROBABLE PROJECT COST					\$ 4,074,000.00

In providing estimates of probable construction cost, 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 estimates of probable construction costs 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 estimate of probable construction cost.

Hinckley Town
Sanitary Sewer Master Plan
June 19, 2024
By: Cody Peck



Loan/Grant Ratio	100% Loan		75/25		70/30		60/40		50/50	
Estimated Project Cost	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000
City Cash Contribution	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000
In-Kind (Other)										
CIB Funded Total	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000
% Grant	0%	0%	25%	25%	30%	30%	40%	40%	50%	50%
% Loan	100%	100%	75%	75%	70%	70%	60%	60%	50%	50%
CIB Grant Amount	\$ -	\$ -	\$ 1,018,500	\$ 993,500	\$ 1,222,200	\$ 1,192,200	\$ 1,629,600	\$ 1,589,600	\$ 2,037,000	\$ 1,987,000
CIB Loan Amount	\$ 4,074,000	\$ 3,974,000	\$ 3,055,500	\$ 2,980,500	\$ 2,851,800	\$ 2,781,800	\$ 2,444,400	\$ 2,384,400	\$ 2,037,000	\$ 1,987,000
Interest Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Loan Term (yrs)	30	30	30	30	30	30	30	30	30	30
Yearly Payment	(\$194,646)	(\$189,868)	(\$145,985)	(\$142,401)	(\$136,252)	(\$132,908)	(\$116,788)	(\$113,921)	(\$97,323)	(\$94,934)

Loan/Grant Percentage	100% Loan		75/25		70/30		60/40		50/50	
Estimated Project Cost	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000	\$ 4,074,000
City Cash Contribution	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000
CIB Funded Total	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000	\$ 4,074,000	\$ 3,974,000
% Grant	0%	0%	25%	25%	30%	30%	40%	40%	50%	50%
% Loan	100%	100%	75%	75%	70%	70%	60%	60%	50%	50%
CIB Grant Amount	\$ -	\$ -	\$ 1,018,500	\$ 993,500	\$ 1,222,200	\$ 1,192,200	\$ 1,629,600	\$ 1,589,600	\$ 2,037,000	\$ 1,987,000
CIB Loan Amount	\$ 4,074,000	\$ 3,974,000	\$ 3,055,500	\$ 2,980,500	\$ 2,851,800	\$ 2,781,800	\$ 2,444,400	\$ 2,384,400	\$ 2,037,000	\$ 1,987,000
Interest Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Loan Term (yrs)	30	30	30	30	30	30	30	30	30	30
Yearly Payment	(\$157,860)	(\$153,985)	(\$118,395)	(\$115,489)	(\$110,502)	(\$107,790)	(\$94,716)	(\$92,391)	(\$78,930)	(\$76,993)

APPENDIX D. WATER BALANCE RESULTS EXISTING HYDRAULIC CONDUCTIVITY BACK-CALCULATION

Current Year	8/30/2022	
Equivalent Population:	8403	8403
Inflow per Population Equiv:	-	gal/day

Month		Normal Precip (in.)	Average Pan Evap. (in.)	Average Lagoon Evap. (in.)	Pan Coefficient
Jan	1	0.56	0.00	0.00	0.75
Feb	2	0.62	0.00	0.00	
Mar	3	0.85	0.00	0.00	
Apr	4	0.84	6.29	4.71	
May	5	0.9	8.73	6.54	
Jun	6	0.5	11.12	8.34	
Jul	7	0.4	12.56	9.42	
Aug	8	0.54	10.75	8.06	
Sep	9	0.64	7.96	5.97	
Oct	10	0.87	4.99	3.74	
Nov	11	0.58	1.16	0.87	
Dec	12	0.59	0.00	0.00	

Time to Fill Primary Cell 1 year
Time to fill Primary & 1st Secondary 2 years
Time to fill primary & 2 secondaries 18-20 years
Time to fill primary & 3 secondaries 40 years

68.88584596
41.24569399
39.06239325

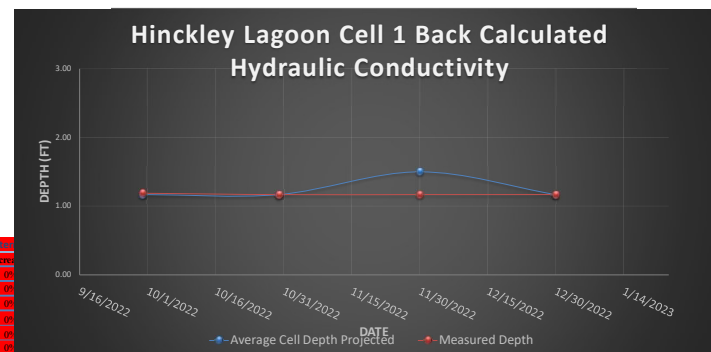
If Discharging Lagoons, is Chlorination used?	No	
Calculate Detention Time	No	Calc only after inputs are done, otherwise leave on "No"
Apply Population Growth	Yes	

		Apply Population Growth					
		Pond 1		Pond 2	Pond 3	Pond 4	
Primary/Secondary		Primary	Secondary	Secondary	Secondary		
4.03	Lagoon Area Bottom =	7	7	7	0	0	acres
	Lagoon Maximum Allowable Depth =	7	6	6	6	0	ft
	Sludge depth if applicable =	0	0	0	0	0	ft
	Lagoon Starting Depth =	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	cm
	Hydraulic Conductivity =	3.5E-01	3.5E-01	0.347450208	0.347450208	0.347450208	ft/m/hr
	Hydraulic Conductivity =	3.5E-01	3.5E-01	#N/A	#N/A	#N/A	ft/m/hr
	Line Thickness =	0	0	#N/A	#N/A	#N/A	inches
Year Seepage Exceeds State Max (6500 gal/ac/day)							

5.857636364

NOTES: Seepage varies with depth of lagoon.

DATE	MONTHLY INFLOW	Monthly	Altered Monthly	AVERAGE PRECIP.	NOISE SEEPAGE VARIES WITH DEPTH OF LAGOON. AVERAGE EVAP.		INFLOW VOLUME Pond 1	Available Storage Pond 1	MONTHLY SEEPAGE VOLUME Pond 1	MONTHLY SEEPAGE VOLUME Pond 1	OUTFLOW Pond 1	DEPTH OF POND 1						
	Monthly Inflow (ACR-FT)	Monthly Inflow Factor	Altered Monthly Inflow (AC-FT)	Average Precipitation (INCH)	Average Evaporation (INCH)	Inflow Volume Pond 1 ACRE-FT	Available Storage Pond 1 (ACR-FT)	Monthly Seepage Volume Pond 1 (AC-FT)	Monthly Seepage Volume Pond 1 (Gallons/acre/day)	Outflow Pond 1 (ACRE-FT)	Depth of Lagoon (FT)	1st pond depth Recalculated	2nd Pond added	3rd Pond added	4th Pond	Average Active Cell Depth	Measured Depths	
9/30/2022																		
9/30/2022	6.17	1.00	6.2	0.64	0.97	3.1	#N/A	#N/A	#N/A	#N/A	#N/A	1.17	0.00	0.00	0.00	1.17	1.28	
10/30/2022	6.95	1.00	7.0	0.87	3.74	5.3	#N/A	#N/A	#N/A	#N/A	#N/A	1.17	0.00	0.00	0.00	1.17	1.19 0.02	
11/30/2022	7.76	1.00	7.8	0.88	0.87	7.6	#N/A	#N/A	#N/A	#N/A	#N/A	1.50	0.00	0.00	0.00	1.50	1.19 0.25	
12/30/2022	9.41	1.00	9.4	0.59	0.00	3.7	#N/A	#N/A	#N/A	#N/A	#N/A	1.17	0.00	0.00	0.00	1.17	1.19 0.00	



APPENDIX E. WATER BALANCE RESULTS: LAGOON OPERATION FOR MAXIMUM GROWTH

44805.00

Time to Fill Primary Cell 1 year
Time to fill Primary & 1st Secondary 2 years
Time to fill primary & 2 secondaries 18-20 years
Time to fill primary & 3 secondaries 40 years

With smith meat 18 years

39.06239325

Flow Increase Pattern	
Year	Flow Increase Factor
2018	θ^1_k
2020	θ^2_k
2030	θ^3_k
2040	θ^4_k
2050	θ^5_k
2060	θ^6_k

45199.00

5.857636364

0.000000583

75

[illegible]

1/28/2019	5.9	1.00	5.9	0.56	0.00	6.01	6.01	3.92	3.92	0
2/28/2019	5.9	1.00	5.9	0.62	0.00	6.01	6.01	4.21	4.21	0
3/28/2019	5.9	1.00	5.9	0.85	0.00	6.01	6.01	4.51	4.51	0
4/28/2019	5.9	1.00	5.9	0.84	0.71	6.01	6.01	4.40	4.40	0
5/28/2019	5.9	1.00	5.9	0.90	6.54	6.01	6.01	4.14	4.14	0
6/28/2019	5.9	1.00	5.9	0.50	8.34	6.01	6.01	3.72	3.72	0
7/28/2019	5.9	1.00	5.9	0.40	9.42	6.01	6.01	3.22	3.22	0
8/28/2019	5.9	1.00	5.9	0.54	8.06	6.01	6.01	2.88	2.88	0
9/28/2019	5.9	1.00	5.9	0.64	5.97	6.01	6.01	2.73	2.73	0
10/28/2019	5.9	1.00	5.9	0.87	3.74	6.01	6.01	2.00	2.00	0
11/28/2019	5.9	1.00	5.9	0.58	0.87	6.01	6.01	3.08	3.08	0
12/28/2019	5.9	1.00	5.9	0.59	0.00	6.01	6.01	3.42	3.42	0
1/28/2040	6.0	1.00	6.0	0.56	0.00	6.01	6.01	3.74	3.74	0
2/28/2040	6.0	1.00	6.0	0.62	0.00	6.01	6.01	4.05	4.05	0
3/28/2040	6.0	1.00	6.0	0.85	0.00	6.01	6.01	4.36	4.36	0
4/28/2040	6.0	1.00	6.0	0.84	4.71	6.01	6.01	4.26	4.26	0
5/28/2040	6.0	1.00	6.0	0.54	8.06	6.01	6.01	4.02	4.02	0
6/28/2040	6.0	1.00	6.0	0.50	8.34	6.01	6.01	3.61	3.61	0
7/28/2040	6.0	1.00	6.0	0.40	9.42	6.01	6.01	3.13	3.13	0
8/28/2040	6.0	1.00	6.0	0.54	8.06	6.01	6.01	2.79	2.79	0
9/28/2040	6.0	1.00	6.0	0.64	5.97	6.01	6.01	2.66	2.66	0
10/28/2040	6.0	1.00	6.0	0.87	3.74	6.01	6.01	2.74	2.74	0
11/28/2040	6.0	1.00	6.0	0.58	0.87	6.01	6.01	3.03	3.03	0
12/28/2040	6.0	1.00	6.0	0.59	0.00	6.01	6.01	3.38	3.38	0
1/28/2041	6.1	1.00	6.1	0.56	0.00	6.01	6.01	3.71	3.71	0
2/28/2041	6.1	1.00	6.1	0.62	0.00	6.01	6.01	4.03	4.03	0
3/28/2041	6.1	1.00	6.1	0.85	0.00	6.01	6.01	4.35	4.35	0
4/28/2041	6.1	1.00	6.1	0.84	4.71	6.01	6.01	4.25	4.25	0
5/28/2041	6.1	1.00	6.1	0.90	6.54	6.01	6.01	4.02	4.02	0
6/28/2041	6.1	1.00	6.1	0.50	8.34	6.01	6.01	3.62	3.62	0
7/28/2041	6.1	1.00	6.1	0.40	9.42	6.01	6.01	3.14	3.14	0
8/28/2041	6.1	1.00	6.1	0.54	8.06	6.01	6.01	2.81	2.81	0
9/28/2041	6.1	1.00	6.1	0.64	5.97	6.01	6.01	2.68	2.68	0
10/28/2041	6.1	1.00	6.1	0.87	3.74	6.01	6.01	2.77	2.77	0
11/28/2041	6.1	1.00	6.1	0.58	0.87	6.01	6.01	3.06	3.06	0
12/28/2041	6.1	1.00	6.1	0.59	0.00	6.01	6.01	3.41	3.41	0
1/28/2042	6.1	1.00	6.1	0.56	0.00	6.01	6.01	3.75	3.75	0
2/28/2042	6.1	1.00	6.1	0.62	0.00	6.01	6.01	4.07	4.07	0
3/28/2042	6.1	1.00	6.1	0.85	0.00	6.01	6.01	4.40	4.40	0
4/28/2042	6.1	1.00	6.1	0.84	4.71	6.01	6.01	4.31	4.31	0
5/28/2042	6.1	1.00	6.1	0.90	6.54	6.01	6.01	4.08	4.08	0
6/28/2042	6.1	1.00	6.1	0.50	8.34	6.01	6.01	3.68	3.68	0
7/28/2042	6.1	1.00	6.1	0.40	9.42	6.01	6.01	3.20	3.20	0
8/28/2042	6.1	1.00	6.1	0.54	8.06	6.01	6.01	2.88	2.88	0
9/28/2042	6.1	1.00	6.1	0.64	5.97	6.01	6.01	2.75	2.75	0
10/28/2042	6.1	1.00	6.1	0.87	3.74	6.01	6.01	2.84	2.84	0
11/28/2042	6.1	1.00	6.1	0.58	0.87	6.01	6.01	3.14	3.14	0
12/28/2042	6.1	1.00	6.1	0.59	0.00	6.01	6.01	3.49	3.49	0
1/28/2043	6.2	1.00	6.2	0.56	0.00	6.01	6.01	3.83	3.83	0
2/28/2043	6.2	1.00	6.2	0.62	0.00	6.01	6.01	4.15	4.15	0
3/28/2043	6.2	1.00	6.2	0.85	0.00	6.01	6.01	4.48	4.48	0
4/28/2043	6.2	1.00	6.2	0.84	4.71	6.01	6.01	4.39	4.39	0
5/28/2043	6.2	1.00	6.2	0.90	6.54	6.01	6.01	4.17	4.17	0
6/28/2043	6.2	1.00	6.2	0.50	8.34	6.01	6.01	3.77	3.77	0
7/28/2043	6.2	1.00	6.2	0.40	9.42	6.01	6.01	3.29	3.29	0
8/28/2043	6.2	1.00	6.2	0.54	8.06	6.01	6.01	2.97	2.97	0
9/28/2043	6.2	1.00	6.2	0.64	5.97	6.01	6.01	2.85	2.85	0
10/28/2043	6.2	1.00	6.2	0.87	3.74	6.01	6.01	2.92	2.92	0
11/28/2043	6.2	1.00	6.2	0.58	0.87	6.01	6.01	3.23	3.23	0
12/28/2043	6.2	1.00	6.2	0.59	0.00	6.01	6.01	3.59	3.59	0
1/28/2044	6.3	1.00	6.3	0.56	0.00	6.01	6.01	3.93	3.93	0
2/28/2044	6.3	1.00	6.3	0.62	0.00	6.01	6.01	4.26	4.26	0
3/28/2044	6.3	1.00	6.3	0.85	0.00	6.01	6.01	4.58	4.58	0
4/28/2044	6.3	1.00	6.3	0.84	4.71	6.01	6.01	4.50	4.50	0
5/28/2044	6.3	1.00	6.3	0.90	6.54	6.01	6.01	4.27	4.27	0
6/28/2044	6.3	1.00	6.3	0.50	8.34	6.01	6.01	3.87	3.87	0
7/28/2044	6.3	1.00	6.3	0.40	9.42	6.01	6.01	3.40	3.40	0
8/28/2044	6.3	1.00	6.3	0.54	8.06	6.01	6.01	3.08	3.08	0
9/28/2044	6.3	1.00	6.3	0.64	5.97	6.01	6.01	2.95	2.95	0
10/28/2044	6.3	1.00	6.3	0.87	3.74	6.01	6.01	3.04	3.04	0
11/28/2044	6.3	1.00	6.3	0.58	0.87	6.01	6.01	3.34	3.34	0
12/28/2044	6.3	1.00	6.3	0.59	0.00	6.01	6.01	3.70	3.70	0
1/28/2045	6.4	1.00	6.4	0.56	0.00	6.01	6.01	4.04	4.04	0
2/28/2045	6.4	1.00	6.4	0.62	0.00	6.01	6.01	4.37	4.37	0
3/28/2045	6.4	1.00	6.4	0.85	0.00	6.01	6.01	4.70	4.70	0
4/28/2045	6.4	1.00	6.4	0.84	4.71	6.01	6.01	4.61	4.61	0
5/28/2045	6.4	1.00	6.4	0.90	6.54	6.01	6.01	4.38	4.38	0
6/28/2045	6.4	1.00	6.4	0.50	8.34	6.01	6.01	3.99	3.99	0
7/28/2045	6.4	1.00	6.4	0.40	9.42	6.01	6.01	3.51	3.51	0
8/28/2045	6.4	1.00	6.4	0.54	8.06	6.01	6.01	3.19	3.19	0
9/28/2045	6.4	1.00	6.4	0.64	5.97	6.01	6.01	3.07	3.07	0
10/28/2045	6.4	1.00	6.4	0.87	3.74	6.01	6.01	3.16	3.16	0
11/28/2045	6.4	1.00	6.4	0.58	0.87	6.01	6.01	3.46	3.46	0
12/28/2045	6.4	1.00	6.4	0.59	0.00	6.01	6.01	3.82	3.82	0
1/28/2046	6.4	1.00	6.4	0.56	0.00	6.01	6.01	4.16	4.16	0
2/28/2046	6.4	1.00	6.4	0.62	0.00	6.01	6.01	4.49	4.49	0
3/28/2046	6.4	1.00	6.4	0.85	0.00	6.01	6.01	4.81	4.81	0
4/28/2046	6.4	1.00	6.4	0.84	4.71	6.01	6.01	4.73	4.73	0
5/28/2046	6.4	1.00	6.4	0.90	6.54	6.01	6.01	4.50	4.50	0
6/28/2046	6.4	1.00	6.4	0.50	8.34	6.01	6.01	4.11	4.11	0
7/28/2046	6.4	1.00	6.4	0.40	9.42	6.01	6.01	3.63	3.63	0
8/28/2046	6.4	1.00	6.4	0.54	8.06	6.01	6.01	3.31	3.31	0
9/28/2046	6.4	1.00	6.4	0.64	5.97	6.01	6.01	3.19	3.19	0
10/28/2046	6.4	1.00	6.4	0.87	3.74	6.01	6.01	3.28	3.28	0
11/28/2046	6.4	1.00	6.4	0.58	0.87	6.01	6.01	3.58	3.58	0
12/28/2046	6.4	1.00	6.4	0.59	0.00	6.01	6.01	3.94	3.94	0
1/28/2047	6.5	1.00	6.5	0.56	0.00	6.01	6.01	4.28	4.28	0
2/28/2047	6.5	1.00	6.5	0.62	0.00	6.01	6.01	4.61	4.61	0
3/28/2047	6.5	1.00	6.5	0.85	0.00	6.01	6.01	4.94	4.94	0
4/28/2047	6.5	1.00	6.5	0.84	4.71	6.01	6.01	4.85	4.85	0
5/28/2047	6.5	1.00	6.5	0.90	6.54	6.01	6.01	4.63	4.63	0
6/28/2047	6.5	1.00	6.5	0.50	8.34	6.01	6.01	4.23	4.23	0
7/28/2047	6.5	1.00	6.5	0.40	9.42	6.01	6.01	3.76	3.76	0
8/28/2047	6.5	1.00	6.5	0.54	8.06	6.01	6.01	3.44	3.44	0
9/28/2047	6.5	1.00	6.5	0.64	5.97	6.01	6.01	3.32	3.32	0
10/28/2047	6.5	1.00	6.5	0.87	3.74	6.01	6.01	3.41	3.41	0
11/28/2047	6.5	1.00	6.5	0.58	0.87	6.01	6.01	3.71	3.71	0
12/28/2047	6.5	1.00	6.5	0.59	0.00	6.01	6.01	4.06	4.06	0
1/28/2048	6.6	1.00	6.6	0.56	0.00	6.01	6.01	4.41	4.41	0
2/28/2048	6.6	1.00	6.6	0.62	0.00	6.01	6.01	4.73	4.73	0
3/28/2048	6.6	1.00	6.6	0.85	0.00	6.01	6.01	5.06	5.06	0
4/28/2048	6.6	1.00	6.6	0.84	4.71	6.01	6.01	4.98	4.98	0
5/28/2048	6.6	1.00	6.6	0.90	6.54	6.01	6.01	4.75	4.75	0
6/28/2048	6.6	1.00	6.6	0.50	8.34	6.01	6.01	4.36	4.36	0
7/28/2048	6.6	1.00	6.6	0.40	9.42	6.01	6.01	3.88	3.88	0
8/28/2048	6.6	1.00	6.6	0.54	8.06	6.01	6.01	3.56	3.56	0
9/28/2048	6.6	1.00	6.6	0.64	5.97	6.01	6.01	3.44	3.44	0
10/28/2048	6.6	1.00	6.6	0.87	3.74	6.01	6.01	3.53	3.53	0
11/28/2048	6.6	1.00	6.6	0.58	0.87	6.01	6.01	3.83	3.83	0

1/28/2048	6.6	1.00	6.6	0.59	0.00	6.01	6.01	4.19	4.19
1/28/2049	6.7	1.00	6.7	0.56	0.00	6.01	6.01	4.53	4.53
2/28/2049	6.7	1.00	6.7	0.62	0.00	6.01	6.01	4.86	4.86
3/28/2049	6.7	1.00	6.7	0.85	0.00	6.01	6.01	5.19	5.19
4/28/2049	6.7	1.00	6.7	0.84	4.71	6.01	6.01	5.11	5.11
5/28/2049	6.7	1.00	6.7	0.90	6.54	6.01	6.01	4.88	4.88
6/28/2049	6.7	1.00	6.7	0.50	8.34	6.01	6.01	4.49	4.49
7/28/2049	6.7	1.00	6.7	0.40	9.42	6.01	6.01	4.01	4.01
8/28/2049	6.7	1.00	6.7	0.54	8.06	6.01	6.01	3.69	3.69
9/28/2049	6.7	1.00	6.7	0.64	5.97	6.01	6.01	3.57	3.57
10/28/2049	6.7	1.00	6.7	0.87	3.74	6.01	6.01	3.66	3.66
11/28/2049	6.7	1.00	6.7	0.58	0.87	6.01	6.01	3.96	3.96
12/28/2049	6.7	1.00	6.7	0.59	0.00	6.01	6.01	4.32	4.32
1/28/2050	6.8	1.00	6.8	0.56	0.00	6.01	6.01	4.66	4.66
2/28/2050	6.8	1.00	6.8	0.62	0.00	6.01	6.01	4.99	4.99
3/28/2050	6.8	1.00	6.8	0.85	0.00	6.01	6.01	5.32	5.32
4/28/2050	6.8	1.00	6.8	0.84	4.71	6.01	6.01	5.34	5.34
5/28/2050	6.8	1.00	6.8	0.90	6.54	6.01	6.01	5.01	5.01
6/28/2050	6.8	1.00	6.8	0.50	8.34	6.01	6.01	4.62	4.62
7/28/2050	6.8	1.00	6.8	0.40	9.42	6.01	6.01	4.14	4.14
8/28/2050	6.8	1.00	6.8	0.54	8.06	6.01	6.01	3.82	3.82
9/28/2050	6.8	1.00	6.8	0.64	5.97	6.01	6.01	3.70	3.70
10/28/2050	6.8	1.00	6.8	0.87	3.74	6.01	6.01	3.79	3.79
11/28/2050	6.8	1.00	6.8	0.58	0.87	6.01	6.01	4.09	4.09
12/28/2050	6.8	1.00	6.8	0.59	0.00	6.01	6.01	4.45	4.45
1/28/2051	6.9	1.00	6.9	0.56	0.00	6.01	6.01	4.79	4.79
2/28/2051	6.9	1.00	6.9	0.62	0.00	6.01	6.01	5.12	5.12
3/28/2051	6.9	1.00	6.9	0.85	0.00	6.01	6.01	5.45	5.45
4/28/2051	6.9	1.00	6.9	0.84	4.71	6.01	6.01	5.37	5.37
5/28/2051	6.9	1.00	6.9	0.90	6.54	6.01	6.01	5.14	5.14
6/28/2051	6.9	1.00	6.9	0.50	8.34	6.01	6.01	4.75	4.75
7/28/2051	6.9	1.00	6.9	0.40	9.42	6.01	6.01	4.28	4.28
8/28/2051	6.9	1.00	6.9	0.54	8.06	6.01	6.01	3.96	3.96
9/28/2051	6.9	1.00	6.9	0.64	5.97	6.01	6.01	3.84	3.84
10/28/2051	6.9	1.00	6.9	0.87	3.74	6.01	6.01	3.93	3.93
11/28/2051	6.9	1.00	6.9	0.58	0.87	6.01	6.01	4.23	4.23
12/28/2051	6.9	1.00	6.9	0.59	0.00	6.01	6.01	4.59	4.59
1/28/2052	7.0	1.00	7.0	0.56	0.00	6.01	6.01	4.93	4.93
2/28/2052	7.0	1.00	7.0	0.62	0.00	6.01	6.01	5.26	5.26
3/28/2052	7.0	1.00	7.0	0.85	0.00	6.01	6.01	5.59	5.59
4/28/2052	7.0	1.00	7.0	0.84	4.71	6.01	6.01	5.50	5.50
5/28/2052	7.0	1.00	7.0	0.90	6.54	6.01	6.01	5.28	5.28
6/28/2052	7.0	1.00	7.0	0.50	8.34	6.01	6.01	4.88	4.88
7/28/2052	7.0	1.00	7.0	0.40	9.42	6.01	6.01	4.41	4.41
8/28/2052	7.0	1.00	7.0	0.54	8.06	6.01	6.01	4.09	4.09
9/28/2052	7.0	1.00	7.0	0.64	5.97	6.01	6.01	3.97	3.97
10/28/2052	7.0	1.00	7.0	0.87	3.74	6.01	6.01	4.06	4.06
11/28/2052	7.0	1.00	7.0	0.58	0.87	6.01	6.01	4.36	4.36
12/28/2052	7.0	1.00	7.0	0.59	0.00	6.01	6.01	4.72	4.72
1/28/2053	7.0	1.00	7.0	0.56	0.00	6.01	6.01	5.06	5.06
2/28/2053	7.0	1.00	7.0	0.62	0.00	6.01	6.01	5.39	5.39
3/28/2053	7.0	1.00	7.0	0.85	0.00	6.01	6.01	5.72	5.72
4/28/2053	7.0	1.00	7.0	0.84	4.71	6.01	6.01	5.64	5.64
5/28/2053	7.0	1.00	7.0	0.90	6.54	6.01	6.01	5.42	5.42
6/28/2053	7.0	1.00	7.0	0.50	8.34	6.01	6.01	5.02	5.02
7/28/2053	7.0	1.00	7.0	0.40	9.42	6.01	6.01	4.55	4.55
8/28/2053	7.0	1.00	7.0	0.54	8.06	6.01	6.01	4.23	4.23
9/28/2053	7.0	1.00	7.0	0.64	5.97	6.01	6.01	4.11	4.11
10/28/2053	7.0	1.00	7.0	0.87	3.74	6.01	6.01	4.20	4.20
11/28/2053	7.0	1.00	7.0	0.58	0.87	6.01	6.01	4.50	4.50
12/28/2053	7.0	1.00	7.0	0.59	0.00	6.01	6.01	4.86	4.86
1/28/2054	7.1	1.00	7.1	0.56	0.00	6.01	6.01	5.20	5.20
2/28/2054	7.1	1.00	7.1	0.62	0.00	6.01	6.01	5.53	5.53
3/28/2054	7.1	1.00	7.1	0.85	0.00	6.01	6.01	5.86	5.86
4/28/2054	7.1	1.00	7.1	0.84	4.71	6.01	6.01	5.78	5.78
5/28/2054	7.1	1.00	7.1	0.90	6.54	6.01	6.01	5.56	5.56
6/28/2054	7.1	1.00	7.1	0.50	8.34	6.01	6.01	5.16	5.16
7/28/2054	7.1	1.00	7.1	0.40	9.42	6.01	6.01	4.69	4.69
8/28/2054	7.1	1.00	7.1	0.54	8.06	6.01	6.01	4.37	4.37
9/28/2054	7.1	1.00	7.1	0.64	5.97	6.01	6.01	4.25	4.25
10/28/2054	7.1	1.00	7.1	0.87	3.74	6.01	6.01	4.34	4.34
11/28/2054	7.1	1.00	7.1	0.58	0.87	6.01	6.01	4.64	4.64
12/28/2054	7.1	1.00	7.1	0.59	0.00	6.01	6.01	5.00	5.00
1/28/2055	7.2	1.00	7.2	0.56	0.00	6.01	6.01	5.34	5.34
2/28/2055	7.2	1.00	7.2	0.62	0.00	6.01	6.01	5.67	5.67
3/28/2055	7.2	1.00	7.2	0.85	0.00	6.01	6.01	6.00	6.00
4/28/2055	7.2	1.00	7.2	0.84	4.71	6.01	6.01	5.92	5.92
5/28/2055	7.2	1.00	7.2	0.90	6.54	6.01	6.01	5.70	5.70
6/28/2055	7.2	1.00	7.2	0.50	8.34	6.01	6.01	5.30	5.30
7/28/2055	7.2	1.00	7.2	0.40	9.42	6.01	6.01	4.83	4.83
8/28/2055	7.2	1.00	7.2	0.54	8.06	6.01	6.01	4.51	4.51
9/28/2055	7.2	1.00	7.2	0.64	5.97	6.01	6.01	4.39	4.39
10/28/2055	7.2	1.00	7.2	0.87	3.74	6.01	6.01	4.48	4.48
11/28/2055	7.2	1.00	7.2	0.58	0.87	6.01	6.01	4.78	4.78
12/28/2055	7.2	1.00	7.2	0.59	0.00	6.01	6.01	5.14	5.14
1/28/2056	7.3	1.00	7.3	0.56	0.00	6.01	6.01	5.48	5.48
2/28/2056	7.3	1.00	7.3	0.62	0.00	6.01	6.01	5.81	5.81
3/28/2056	7.3	1.00	7.3	0.85	0.00	6.01	6.01	6.14	6.14
4/28/2056	7.3	1.00	7.3	0.84	4.71	6.01	6.01	6.06	6.06
5/28/2056	7.3	1.00	7.3	0.90	6.54	6.01	6.01	5.84	5.84
6/28/2056	7.3	1.00	7.3	0.50	8.34	6.01	6.01	5.44	5.44
7/28/2056	7.3	1.00	7.3	0.40	9.42	6.01	6.01	4.97	4.97
8/28/2056	7.3	1.00	7.3	0.54	8.06	6.01	6.01	4.65	4.65
9/28/2056	7.3	1.00	7.3	0.64	5.97	6.01	6.01	4.53	4.53
10/28/2056	7.3	1.00	7.3	0.87	3.74	6.01	6.01	4.62	4.62
11/28/2056	7.3	1.00	7.3	0.58	0.87	6.01	6.01	4.93	4.93
12/28/2056	7.3	1.00	7.3	0.59	0.00	6.01	6.01	5.28	5.28
1/28/2057	7.4	1.00	7.4	0.56	0.00	6.01	6.01	5.63	5.63
2/28/2057	7.4	1.00	7.4	0.62	0.00	6.01	6.01	5.96	5.96
3/28/2057	7.4	1.00	7.4	0.85	0.00	6.01	6.01	6.29	6.29
4/28/2057	7.4	1.00	7.4	0.84	4.71	6.01	6.01	6.21	6.21
5/28/2057	7.4	1.00	7.4	0.90	6.54	6.01	6.01	5.98	5.98
6/28/2057	7.4	1.00	7.4	0.50	8.34	6.01	6.01	5.59	5.59
7/28/2057	7.4	1.00	7.4	0.40	9.42	6.01	6.01	5.12	5.12
8/28/2057	7.4	1.00	7.4	0.54	8.06	6.01	6.01	4.80	4.80
9/28/2057	7.4	1.00	7.4	0.64	5.97	6.01	6.01	4.68	4.68
10/28/2057	7.4	1.00	7.4	0.87	3.74	6.01	6.01	4.77	4.77
11/28/2057	7.4	1.00	7.4	0.58	0.87	6.01	6.01	5.07	5.07
12/28/2057	7.4	1.00	7.4	0.59	0.00	6.01	6.01	5.43	5.43
1/28/2058	7.5	1.00	7.5	0.56	0.00	6.01	6.01	5.78	5.78
2/28/2058	7.5	1.00	7.5	0.62	0.00	6.01	6.01	6.11	6.11
3/28/2058	7.5	1.00	7.5	0.85	0.00	6.01	6.01	6.44	6.44
4/28/2058	7.5	1.00	7.5	0.84	4.71	6.01	6.01	6.36	6.36
5/28/2058	7.5	1.00	7.5	0.90	6.54	6.01	6.01	6.13	6.13
6/28/2058	7.5	1.00	7.5	0.50	8.34	6.01	6.01	5.74	5.74
7/28/2058	7.5	1.00	7.5	0.40	9.42	6.01	6.01	5.27	5.27
8/28/2058	7.5	1.00	7.5	0.54	8.06	6.01	6.01	4.95	4.95
9/28/2058	7.5	1.00	7.5	0.64	5.97	6.01	6.01	4.83	4.83
10/28/2058	7.5	1.00	7.5	0.87	3.74	6.01	6.01	4.92	4.92

1/28/2008	7.5	1.00	7.5	0.58	0.87					6.01	6.01	5.22		5.22					0
12/28/2008	7.5	1.00	7.5	0.59	0.00					6.01	6.01	5.58		5.58					0
1/28/2009	7.6	1.00	7.6	0.56	0.00					6.01	6.01	5.92		5.92					0
2/28/2009	7.6	1.00	7.6	0.62	0.00					6.01	6.01	6.25		6.25					0
3/28/2009	7.6	1.00	7.6	0.85	0.00					6.01	6.01	6.59		6.59					0
4/28/2009	7.6	1.00	7.6	0.84	4.71					6.01	6.01	6.50		6.50					0
5/28/2009	7.6	1.00	7.6	0.90	6.54					6.01	6.01	6.28		6.28					0
6/28/2009	7.6	1.00	7.6	0.50	8.34					6.01	6.01	5.89		5.89					0
7/28/2009	7.6	1.00	7.6	0.40	9.42					6.01	6.01	5.42		5.42					0
8/28/2009	7.6	1.00	7.6	0.54	8.06					6.01	6.01	5.10		5.10					0
9/28/2009	7.6	1.00	7.6	0.64	5.97					6.01	6.01	4.98		4.98					0
10/28/2009	7.6	1.00	7.6	0.87	3.74					6.01	6.01	5.07		5.07					0
11/28/2009	7.6	1.00	7.6	0.58	0.87					6.01	6.01	5.37		5.37					0
12/28/2009	7.6	1.00	7.6	0.59	0.00					6.01	6.01	5.73		5.73					0
1/28/2000	7.7	1.00	7.7	0.56	0.00					6.01	6.01	6.07		6.07					0
2/28/2000	7.7	1.00	7.7	0.62	0.00					6.01	6.01	6.41		6.41					0
3/28/2000	7.7	1.00	7.7	0.85	0.00					6.01	6.01	6.74		6.74					0
4/28/2000	7.7	1.00	7.7	0.84	4.71					6.01	6.01	6.66		6.66					0
5/28/2000	7.7	1.00	7.7	0.90	6.54					6.01	6.01	6.43		6.43					0
6/28/2000	7.7	1.00	7.7	0.50	8.34					6.01	6.01	6.04		6.04					0
7/28/2000	7.7	1.00	7.7	0.40	9.42					6.01	6.01	5.57		5.57					0
8/28/2000	7.7	1.00	7.7	0.54	8.06					6.01	6.01	5.25		5.25					0
9/28/2000	7.7	1.00	7.7	0.64	5.97					6.01	6.01	5.13		5.13					0
10/28/2000	7.7	1.00	7.7	0.87	3.74					6.01	6.01	5.22		5.22					0
11/28/2000	7.7	1.00	7.7	0.58	0.87					6.01	6.01	5.52		5.52					0
12/28/2000	7.7	1.00	7.7	0.59	0.00					6.01	6.01	5.88		5.88					0
1/28/2001	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2001	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2001	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2001	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2001	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2001	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A		#N/A					0
7/28/2001	#N/A	1.00	#N/A	0.40	9.42					6.01	6.01	#N/A		#N/A					0
8/28/2001	#N/A	1.00	#N/A	0.54	8.06					6.01	6.01	#N/A		#N/A					0
9/28/2001	#N/A	1.00	#N/A	0.64	5.97					6.01	6.01	#N/A		#N/A					0
10/28/2001	#N/A	1.00	#N/A	0.87	3.74					6.01	6.01	#N/A		#N/A					0
11/28/2001	#N/A	1.00	#N/A	0.58	0.87					6.01	6.01	#N/A		#N/A					0
12/28/2001	#N/A	1.00	#N/A	0.59	0.00					6.01	6.01	#N/A		#N/A					0
1/28/2002	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2002	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2002	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2002	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2002	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2002	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A		#N/A					0
7/28/2002	#N/A	1.00	#N/A	0.40	9.42					6.01	6.01	#N/A		#N/A					0
8/28/2002	#N/A	1.00	#N/A	0.54	8.06					6.01	6.01	#N/A		#N/A					0
9/28/2002	#N/A	1.00	#N/A	0.64	5.97					6.01	6.01	#N/A		#N/A					0
10/28/2002	#N/A	1.00	#N/A	0.87	3.74					6.01	6.01	#N/A		#N/A					0
11/28/2002	#N/A	1.00	#N/A	0.58	0.87					6.01	6.01	#N/A		#N/A					0
12/28/2002	#N/A	1.00	#N/A	0.59	0.00					6.01	6.01	#N/A		#N/A					0
1/28/2003	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2003	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2003	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2003	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2003	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2003	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A		#N/A					0
7/28/2003	#N/A	1.00	#N/A	0.40	9.42					6.01	6.01	#N/A		#N/A					0
8/28/2003	#N/A	1.00	#N/A	0.54	8.06					6.01	6.01	#N/A		#N/A					0
9/28/2003	#N/A	1.00	#N/A	0.64	5.97					6.01	6.01	#N/A		#N/A					0
10/28/2003	#N/A	1.00	#N/A	0.87	3.74					6.01	6.01	#N/A		#N/A					0
11/28/2003	#N/A	1.00	#N/A	0.58	0.87					6.01	6.01	#N/A		#N/A					0
12/28/2003	#N/A	1.00	#N/A	0.59	0.00					6.01	6.01	#N/A		#N/A					0
1/28/2004	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2004	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2004	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2004	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2004	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2004	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A		#N/A					0
7/28/2004	#N/A	1.00	#N/A	0.40	9.42					6.01	6.01	#N/A		#N/A					0
8/28/2004	#N/A	1.00	#N/A	0.54	8.06					6.01	6.01	#N/A		#N/A					0
9/28/2004	#N/A	1.00	#N/A	0.64	5.97					6.01	6.01	#N/A		#N/A					0
10/28/2004	#N/A	1.00	#N/A	0.87	3.74					6.01	6.01	#N/A		#N/A					0
11/28/2004	#N/A	1.00	#N/A	0.58	0.87					6.01	6.01	#N/A		#N/A					0
12/28/2004	#N/A	1.00	#N/A	0.59	0.00					6.01	6.01	#N/A		#N/A					0
1/28/2005	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2005	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2005	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2005	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2005	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2005	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A		#N/A					0
7/28/2005	#N/A	1.00	#N/A	0.40	9.42					6.01	6.01	#N/A		#N/A					0
8/28/2005	#N/A	1.00	#N/A	0.54	8.06					6.01	6.01	#N/A		#N/A					0
9/28/2005	#N/A	1.00	#N/A	0.64	5.97					6.01	6.01	#N/A		#N/A					0
10/28/2005	#N/A	1.00	#N/A	0.87	3.74					6.01	6.01	#N/A		#N/A					0
11/28/2005	#N/A	1.00	#N/A	0.58	0.87					6.01	6.01	#N/A		#N/A					0
12/28/2005	#N/A	1.00	#N/A	0.59	0.00					6.01	6.01	#N/A		#N/A					0
1/28/2006	#N/A	1.00	#N/A	0.56	0.00					6.01	6.01	#N/A		#N/A					0
2/28/2006	#N/A	1.00	#N/A	0.62	0.00					6.01	6.01	#N/A		#N/A					0
3/28/2006	#N/A	1.00	#N/A	0.85	0.00					6.01	6.01	#N/A		#N/A					0
4/28/2006	#N/A	1.00	#N/A	0.84	4.71					6.01	6.01	#N/A		#N/A					0
5/28/2006	#N/A	1.00	#N/A	0.90	6.54					6.01	6.01	#N/A		#N/A					0
6/28/2006	#N/A	1.00	#N/A	0.50	8.34					6.01	6.01	#N/A							

[illegible]

APPENDIX F. WATER BALANCE RESULTS: LAGOON OPERATION FOR MIDRANGE GROWTH

44805.00

Current Year	2023
Equivalent Population:	8403
Inflow per Population Equiv:	gal/day

Month	Normal Precip (in.)	Average Pan Evap (in.)	Average Lagoon Evap (in.)	Pan Coefficient
Jun 1	0.56	0.00	0.00	0.75
Feb 2	0.62	0.00	0.00	
Mar 3	0.85	0.00	0.00	
Apr 4	0.84	6.29	4.71	
May 5	0.9	8.73	6.54	
Jun 6	0.5	11.12	8.34	
Jul 7	0.4	12.56	9.42	
Aug 8	0.54	10.75	8.06	
Sep 9	0.64	7.96	5.97	
Oct 10	0.87	4.99	3.74	
Nov 11	0.58	1.16	0.87	
Dec 12	0.59	0.00	0.00	

With smith meat 18 years

Time to Fill Primary Cell 1 year
Time to fill Primary & 1st Secondary 2 years
Time to fill primary & 2 secondaries 18-20 years
Time to fill primary & 3 secondaries 40 years

68.88384596
41.24609399
39.06239325

Year	Dom Increase Factor
2018	0%
2020	0%
2030	0%
2040	0%
2050	0%

1.00	IT/Discharging Lagoons, is Chlorination used?	No
	Calculate Detention Time	No
	Apply Population Growth	Yes
	Primary/Secondary	Pond 1 Primary Pond 2 Secondary Pond 3 Secondary Pond 4 Secondary
	Lagoon Area Bottom	7.17 2.2 4.3 0
	Lagoon Maximum Allowable Depth	6 6 6 6
	Sludge depth if applicable	0 0 0 0
	Lagoon Starting Depth	0.6 0.6 0.6 0.6
	Hydraulic Conductivity	0.78E+07 3.0E+07 0.0E+07 0.0E+07
	Hydraulic Conductivity	2.8E+02 2.0E+02 0.0E+02 0.0E+02
	Liner Thickness	1 1 1 1
	Year Seepage Exceeds State Max (6500 gal/ac/day)	#N/A #N/A #N/A #N/A

45199.00

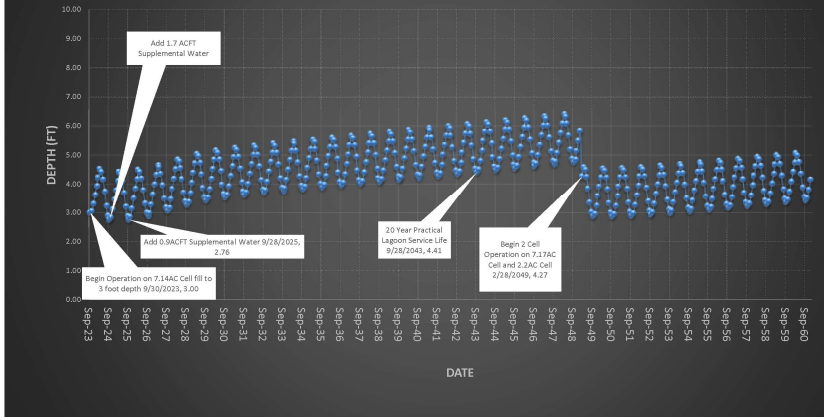
5.857636364

0.000000583

MONTHLY INFLOW	Monthly Inflow	Altered Monthly Inflow	AVERAGE PRECIP.	AVERAGE EVAP.	INFLOW VOLUME POND1	Available Storage Pond 1
----------------	----------------	------------------------	-----------------	---------------	---------------------	--------------------------

DATE	Monthly Inflow (AC. FT.)	Monthly Inflow Factor	Altered Monthly Inflow (AC. FT.)	Average Precipitation (INCH)	Average Evaporation (INCH)
9/30/2023	3.7	1.00	3.7	0.64	6.0
10/30/2023	3.7	1.00	3.7	0.87	3.74
11/30/2023	3.7	1.00	3.7	0.58	0.87
12/30/2023	3.7	1.00	3.7	0.59	0.00
1/30/2024	3.8	1.00	3.8	0.56	0.00
2/29/2024	3.8	1.00	3.8	0.62	0.00
3/29/2024	3.8	1.00	3.8	0.85	0.00
4/29/2024	3.8	1.00	3.8	0.84	4.71
5/29/2024	3.8	1.00	3.8	0.90	6.54
6/29/2024	3.8	1.00	3.8	0.50	8.34
7/29/2024	3.8	1.00	3.8	0.40	9.42
8/29/2024	3.8	1.00	3.8	0.54	8.06
9/29/2024	3.8	1.00	3.8	0.64	5.97
10/29/2024	3.8	1.00	3.8	0.87	3.74
11/29/2024	3.8	1.00	3.8	0.58	0.87
12/29/2024	3.8	1.00	3.8	0.59	0.00
1/29/2025	3.9	1.00	3.9	0.56	0.00
2/28/2025	3.9	1.00	3.9	0.62	0.00
3/28/2025	3.9	1.00	3.9	0.85	0.00
4/28/2025	3.9	1.00	3.9	0.84	4.71
5/28/2025	3.9	1.00	3.9	0.90	6.54
6/28/2025	3.9	1.00	3.9	0.50	8.34
7/28/2025	3.9	1.00	3.9	0.40	9.42
8/28/2025	3.9	1.00	3.9	0.54	8.06
9/28/2025	3.9	1.00	3.9	0.64	5.97
10/28/2025	3.9	1.00	3.9	0.87	3.74
11/28/2025	3.9	1.00	3.9	0.58	0.87
12/28/2025	3.9	1.00	3.9	0.59	0.00
1/28/2026	4.0	1.00	4.0	0.56	0.00
2/28/2026	4.0	1.00	4.0	0.62	0.00
3/28/2026	4.0	1.00	4.0	0.85	0.00
4/28/2026	4.0	1.00	4.0	0.84	4.71
5/28/2026	4.0	1.00	4.0	0.90	6.54
6/28/2026	4.0	1.00	4.0	0.50	8.34
7/28/2026	4.0	1.00	4.0	0.40	9.42
8/28/2026	4.0	1.00	4.0	0.54	8.06
9/28/2026	4.0	1.00	4.0	0.64	5.97
10/28/2026	4.0	1.00	4.0	0.87	3.74
11/28/2026	4.0	1.00	4.0	0.58	0.87
12/28/2026	4.0	1.00	4.0	0.59	0.00
1/28/2027	4.1	1.00	4.1	0.56	0.00
2/28/2027	4.1	1.00	4.1	0.62	0.00
3/28/2027	4.1	1.00	4.1	0.85	0.00
4/28/2027	4.1	1.00	4.1	0.84	4.71
5/28/2027	4.1	1.00	4.1	0.90	6.54
6/28/2027	4.1	1.00	4.1	0.50	8.34
7/28/2027	4.1	1.00	4.1	0.40	9.42
8/28/2027	4.1	1.00	4.1	0.54	8.06
9/28/2027	4.1	1.00	4.1	0.64	5.97
10/28/2027	4.1	1.00	4.1	0.87	3.74
11/28/2027	4.1	1.00	4.1	0.58	0.87
12/28/2027	4.1	1.00	4.1	0.59	0.00
1/28/2028	4.2	1.00	4.2	0.56	0.00
2/28/2028	4.2	1.00	4.2	0.62	0.00
3/28/2028	4.2	1.00	4.2	0.85	0.00
4/28/2028	4.2	1.00	4.2	0.84	4.71
5/28/2028	4.2	1.00	4.2	0.90	6.54
6/28/2028	4.2	1.00	4.2	0.50	8.34
7/28/2028	4.2	1.00	4.2	0.40	9.42

Hinckley Midrange Growth Senario



if negative inflows, then more evaporation than pre

Operation on Pond 1 and						Average Active Cell		Measured Depths	
1st pond depth	2	Operation on All 3 Ponds	4th Pond	Depth					
3.00	0.00	0.00		3.00					1
3.05	0.00	0.00		3.05					1
3.30	0.00	0.00		3.30					1
3.62	0.00	0.00		3.62					1
3.93	0.00	0.00		3.93					1
4.23	0.00	0.00		4.23					1
4.52	0.00	0.00		4.52					1
4.41	0.00	0.00		4.41					1
4.16	0.00	0.00		4.16					1
3.73	0.00	0.00		3.73					1
3.24	0.00	0.00		3.24					1
2.90	0.00	0.00		2.90					0
2.76	0.00	0.00		2.76					0
2.83	0.00	0.00		2.83					0
3.11	0.00	0.00		3.11					1
3.45	0.00	0.00		3.45					1
3.79	0.00	0.00		3.79					1
4.10	0.00	0.00		4.10					1
4.42	0.00	0.00		4.42					1
4.33	0.00	0.00		4.33					1
4.09	0.00	0.00		4.09					1
3.69	0.00	0.00		3.69					1
3.21	0.00	0.00		3.21					1
2.88	0.00	0.00		2.88					0
2.76	0.00	0.00		2.76					0
2.84	0.00	0.00		2.84					0
3.14	0.00	0.00		3.14					1
3.49	0.00	0.00		3.49					1
3.84	0.00	0.00		3.84					1
4.17	0.00	0.00		4.17					1
4.49	0.00	0.00		4.49					1
4.41	0.00	0.00		4.41					1
4.18	0.00	0.00		4.18					1
3.79	0.00	0.00		3.79					1
3.32	0.00	0.00		3.32					1
3.00	0.00	0.00		3.00					0
2.88	0.00	0.00		2.88					0
2.97	0.00	0.00		2.97					0
3.28	0.00	0.00		3.28					1
3.63	0.00	0.00		3.63					1
3.98	0.00	0.00		3.98					1
4.32	0.00	0.00		4.32					1
4.65	0.00	0.00		4.65					1
4.57	0.00	0.00		4.57					1
4.35	0.00	0.00		4.35					1
3.96	0.00	0.00		3.96					1
3.49	0.00	0.00		3.49					1
3.18	0.00	0.00		3.18					1
3.06	0.00	0.00		3.06					1
3.16	0.00	0.00		3.16					1
3.46	0.00	0.00		3.46					1
3.83	0.00	0.00		3.83					1
4.18	0.00	0.00		4.18					1
4.51	0.00	0.00		4.51					1
4.85	0.00	0.00		4.85					1
4.77	0.00	0.00		4.77					1
4.55	0.00	0.00		4.55					1
4.16	0.00	0.00		4.16					1
3.70	0.00	0.00		3.70					1

8/28/2028	4.2	1.00	4.2	0.54	8.06					3.38	0.00	0.00		3.38		
9/28/2028	4.2	1.00	4.2	0.64	5.97					3.27	0.00	0.00		3.27		
10/28/2028	4.2	1.00	4.2	0.87	3.74					3.37	0.00	0.00		3.37		
11/28/2028	4.2	1.00	4.2	0.58	0.87					3.08	0.00	0.00		3.08		
12/28/2028	4.2	1.00	4.2	0.59	0.00					4.04	0.00	0.00		4.04		
1/28/2029	4.2	1.00	4.2	0.56	0.00					4.38	0.00	0.00		4.38		
2/28/2029	4.2	1.00	4.2	0.62	0.00					4.71	0.00	0.00		4.71		
3/28/2029	4.2	1.00	4.2	0.85	0.00					5.04	0.00	0.00		5.04		
4/28/2029	4.2	1.00	4.2	0.84	4.71					4.96	0.00	0.00		4.96		
5/28/2029	4.2	1.00	4.2	0.90	6.54					4.73	0.00	0.00		4.73		
6/28/2029	4.2	1.00	4.2	0.50	8.34					4.33	0.00	0.00		4.33		
7/28/2029	4.2	1.00	4.2	0.40	9.42					3.86	0.00	0.00		3.86		
8/28/2029	4.2	1.00	4.2	0.54	8.06					3.54	0.00	0.00		3.54		
9/28/2029	4.2	1.00	4.2	0.64	5.97					3.42	0.00	0.00		3.42		
10/28/2029	4.2	1.00	4.2	0.87	3.74					3.52	0.00	0.00		3.52		
11/28/2029	4.2	1.00	4.2	0.58	0.87					3.83	0.00	0.00		3.83		
12/28/2029	4.2	1.00	4.2	0.59	0.00					4.18	0.00	0.00		4.18		
1/28/2030	4.2	1.00	4.2	0.56	0.00					4.52	0.00	0.00		4.52		
2/28/2030	4.2	1.00	4.2	0.62	0.00					4.84	0.00	0.00		4.84		
3/28/2030	4.2	1.00	4.2	0.85	0.00					5.17	0.00	0.00		5.17		
4/28/2030	4.2	1.00	4.2	0.84	4.71					5.08	0.00	0.00		5.08		
5/28/2030	4.2	1.00	4.2	0.90	6.54					4.85	0.00	0.00		4.85		
6/28/2030	4.2	1.00	4.2	0.50	8.34					4.45	0.00	0.00		4.45		
7/28/2030	4.2	1.00	4.2	0.40	9.42					3.97	0.00	0.00		3.97		
8/28/2030	4.2	1.00	4.2	0.54	8.06					3.65	0.00	0.00		3.65		
9/28/2030	4.2	1.00	4.2	0.64	5.97					3.53	0.00	0.00		3.53		
10/28/2030	4.2	1.00	4.2	0.87	3.74					3.62	0.00	0.00		3.62		
11/28/2030	4.2	1.00	4.2	0.58	0.87					3.92	0.00	0.00		3.92		
12/28/2030	4.2	1.00	4.2	0.59	0.00					4.28	0.00	0.00		4.28		
1/28/2031	4.3	1.00	4.3	0.56	0.00					4.61	0.00	0.00		4.61		
2/28/2031	4.3	1.00	4.3	0.62	0.00					4.94	0.00	0.00		4.94		
3/28/2031	4.3	1.00	4.3	0.85	0.00					5.26	0.00	0.00		5.26		
4/28/2031	4.3	1.00	4.3	0.84	4.71					5.17	0.00	0.00		5.17		
5/28/2031	4.3	1.00	4.3	0.90	6.54					4.94	0.00	0.00		4.94		
6/28/2031	4.3	1.00	4.3	0.50	8.34					4.54	0.00	0.00		4.54		
7/28/2031	4.3	1.00	4.3	0.40	9.42					4.06	0.00	0.00		4.06		
8/28/2031	4.3	1.00	4.3	0.54	8.06					3.74	0.00	0.00		3.74		
9/28/2031	4.3	1.00	4.3	0.64	5.97					3.61	0.00	0.00		3.61		
10/28/2031	4.3	1.00	4.3	0.87	3.74					3.70	0.00	0.00		3.70		
11/28/2031	4.3	1.00	4.3	0.58	0.87					4.00	0.00	0.00		4.00		
12/28/2031	4.3	1.00	4.3	0.59	0.00					4.36	0.00	0.00		4.36		
1/28/2032	4.3	1.00	4.3	0.56	0.00					4.69	0.00	0.00		4.69		
2/28/2032	4.3	1.00	4.3	0.62	0.00					5.01	0.00	0.00		5.01		
3/28/2032	4.3	1.00	4.3	0.85	0.00					5.34	0.00	0.00		5.34		
4/28/2032	4.3	1.00	4.3	0.84	4.71					5.25	0.00	0.00		5.25		
5/28/2032	4.3	1.00	4.3	0.90	6.54					5.01	0.00	0.00		5.01		
6/28/2032	4.3	1.00	4.3	0.50	8.34					4.61	0.00	0.00		4.61		
7/28/2032	4.3	1.00	4.3	0.40	9.42					4.13	0.00	0.00		4.13		
8/28/2032	4.3	1.00	4.3	0.54	8.06					3.81	0.00	0.00		3.81		
9/28/2032	4.3	1.00	4.3	0.64	5.97					3.69	0.00	0.00		3.69		
10/28/2032	4.3	1.00	4.3	0.87	3.74					3.77	0.00	0.00		3.77		
11/28/2032	4.3	1.00	4.3	0.58	0.87					4.07	0.00	0.00		4.07		
12/28/2032	4.3	1.00	4.3	0.59	0.00					4.43	0.00	0.00		4.43		
1/28/2033	4.3	1.00	4.3	0.56	0.00					4.76	0.00	0.00		4.76		
2/28/2033	4.3	1.00	4.3	0.62	0.00					5.08	0.00	0.00		5.08		
3/28/2033	4.3	1.00	4.3	0.85	0.00					5.41	0.00	0.00		5.41		
4/28/2033	4.3	1.00	4.3	0.84	4.71					5.32	0.00	0.00		5.32		
5/28/2033	4.3	1.00	4.3	0.90	6.54					5.08	0.00	0.00		5.08		
6/28/2033	4.3	1.00	4.3	0.50	8.34					4.68	0.00	0.00		4.68		
7/28/2033	4.3	1.00	4.3	0.40	9.42					4.20	0.00	0.00		4.20		
8/28/2033	4.3	1.00	4.3	0.54	8.06					3.88	0.00	0.00		3.88		
9/28/2033	4.3	1.00	4.3	0.64	5.97					3.75	0.00	0.00		3.75		
10/28/2033	4.3	1.00	4.3	0.87	3.74					3.84	0.00	0.00		3.84		
11/28/2033	4.3	1.00	4.3	0.58	0.87					4.14	0.00	0.00		4.14		
12/28/2033	4.3	1.00	4.3	0.59	0.00					4.50	0.00	0.00		4.50		
1/28/2034	4.3	1.00	4.3	0.56	0.00					4.83	0.00	0.00		4.83		
2/28/2034	4.3	1.00	4.3	0.62	0.00					5.15	0.00	0.00		5.15		
3/28/2034	4.3	1.00	4.3	0.85	0.00					5.47	0.00	0.00		5.47		
4/28/2034	4.3	1.00	4.3	0.84	4.71					5.38	0.00	0.00		5.38		
5/28/2034	4.3	1.00	4.3	0.90	6.54					5.15	0.00	0.00		5.15		
6/28/2034	4.3	1.00	4.3	0.50	8.34					4.75	0.00	0.00		4.75		
7/28/2034	4.3	1.00	4.3	0.40	9.42					4.27	0.00	0.00		4.27		
8/28/2034	4.3	1.00	4.3	0.54	8.06					3.94	0.00	0.00		3.94		
9/28/2034	4.3	1.00	4.3	0.64	5.97					3.82	0.00	0.00		3.82		
10/28/2034	4.3	1.00	4.3	0.87	3.74					3.91	0.00	0.00		3.91		
11/28/2034	4.3	1.00	4.3	0.58	0.87					4.21	0.00	0.00		4.21		
12/28/2034	4.3	1.00	4.3	0.59	0.00					4.56	0.00	0.00		4.56		
1/28/2035	4.4	1.00	4.4	0.56	0.00					4.90	0.00	0.00		4.90		
2/28/2035	4.4	1.00	4.4	0.62	0.00					5.22	0.00	0.00		5.22		
3/28/2035	4.4	1.00	4.4	0.85	0.00					5.54	0.00	0.00		5.54		
4/28/2035	4.4	1.00	4.4	0.84	4.71					5.45	0.00	0.00		5.45		
5/28/2035	4.4	1.00	4.4	0.90	6.54					5.21	0.00	0.00		5.21		
6/28/2035	4.4	1.00	4.4	0.50	8.34					4.81	0.00	0.00		4.81		
7/28/2035	4.4	1.00	4.4	0.40	9.42					4.33	0.00	0.00		4.33		
8/28/2035	4.4	1.00	4.4	0.54	8.06					4.01	0.00	0.00		4.01		
9/28/2035	4.4	1.00	4.4	0.64	5.97					3.88	0.00	0.00		3.88		
10/28/2035	4.4	1.00	4.4	0.87	3.74					3.97	0.00	0.00		3.97		
11/28/2035	4.4	1.00	4.4	0.58	0.87					4.27	0.00	0.00		4.27		
12/28/2035	4.4	1.00	4.4	0.59	0.00					4.63	0.00	0.00		4.63		
1/28/2036	4.4	1.00	4.4	0.56	0.00					4.96	0.00	0.00		4.96		
2/28/2036	4.4	1.00	4.4	0.62	0.00					5.28	0.00	0.00		5.28		
3/28/2036	4.4	1.00	4.4	0.85	0.00					5.60	0.00	0.00		5.60		
4/28/2036	4.4	1.00	4.4	0.84	4.71					5.51	0.00	0.00		5.51		
5/28/2036	4.4	1.00	4.4	0.90	6.54					5.28	0.00	0.00		5.28		
6/28/2036	4.4	1.00	4.4	0.50	8.34					4.88	0.00	0.00		4.88		
7/28/2036	4.4	1.00	4.4	0.40	9.42					4.40	0.00	0.00		4.40		
8/28/2036	4.4	1.00	4.4	0.54	8.06					4.07	0.00	0.00		4.07		
9/28/2036	4.4	1.00	4.4	0.64	5.97					3.95	0.00	0.00		3.95		
10/28/2036	4.4	1.00	4.4	0.87	3.74					4.04	0.00	0.00				

2/28/2003	4.5	1.00	4.5	0.56	0.00					5.09	0.00	0.00			5.09			
2/28/2003	4.5	1.00	4.5	0.62	0.00					5.41	0.00	0.00			5.41			
3/28/2003	4.5	1.00	4.5	0.85	0.00					5.73	0.00	0.00			5.73			
4/28/2003	4.5	1.00	4.5	0.84	4.71					5.64	0.00	0.00	0.00		5.64			
5/28/2003	4.5	1.00	4.5	0.90	6.54					5.41	0.00	0.00	0.00		5.41			
6/28/2003	4.5	1.00	4.5	0.50	8.34					5.01	0.00	0.00	0.00		5.01			
7/28/2003	4.5	1.00	4.5	0.40	9.42					4.53	0.00	0.00	0.00		4.53			
8/28/2003	4.5	1.00	4.5	0.54	8.06					4.20	0.00	0.00	0.00		4.20			
9/28/2003	4.5	1.00	4.5	0.64	5.97					4.08	0.00	0.00	0.00		4.08			
10/28/2003	4.5	1.00	4.5	0.87	3.74					4.17	0.00	0.00	0.00		4.17			
11/28/2003	4.5	1.00	4.5	0.58	0.87					4.47	0.00	0.00	0.00		4.47			
12/28/2003	4.5	1.00	4.5	0.59	0.00					4.83	0.00	0.00	0.00		4.83			
1/28/2004	4.5	1.00	4.5	0.56	0.00					5.15	0.00	0.00	0.00		5.15			
2/28/2004	4.5	1.00	4.5	0.62	0.00					5.48	0.00	0.00	0.00		5.48			
3/28/2004	4.5	1.00	4.5	0.85	0.00					5.80	0.00	0.00	0.00		5.80			
4/28/2004	4.5	1.00	4.5	0.84	4.71					5.71	0.00	0.00	0.00		5.71			
5/28/2004	4.5	1.00	4.5	0.90	6.54					5.47	0.00	0.00	0.00		5.47			
6/28/2004	4.5	1.00	4.5	0.50	8.34					5.07	0.00	0.00	0.00		5.07			
7/28/2004	4.5	1.00	4.5	0.40	9.42					4.59	0.00	0.00	0.00		4.59			
8/28/2004	4.5	1.00	4.5	0.54	8.06					4.27	0.00	0.00	0.00		4.27			
9/28/2004	4.5	1.00	4.5	0.64	5.97					4.14	0.00	0.00	0.00		4.14			
10/28/2004	4.5	1.00	4.5	0.87	3.74					4.23	0.00	0.00	0.00		4.23			
11/28/2004	4.5	1.00	4.5	0.58	0.87					4.53	0.00	0.00	0.00		4.53			
12/28/2004	4.5	1.00	4.5	0.59	0.00					4.88	0.00	0.00	0.00		4.88			
1/28/2005	4.5	1.00	4.5	0.56	0.00					5.22	0.00	0.00	0.00		5.22			
2/28/2005	4.5	1.00	4.5	0.62	0.00					5.54	0.00	0.00	0.00		5.54			
3/28/2005	4.5	1.00	4.5	0.85	0.00					5.86	0.00	0.00	0.00		5.86			
4/28/2005	4.5	1.00	4.5	0.84	4.71					5.77	0.00	0.00	0.00		5.77			
5/28/2005	4.5	1.00	4.5	0.90	6.54					5.54	0.00	0.00	0.00		5.54			
6/28/2005	4.5	1.00	4.5	0.50	8.34					5.14	0.00	0.00	0.00		5.14			
7/28/2005	4.5	1.00	4.5	0.40	9.42					4.66	0.00	0.00	0.00		4.66			
8/28/2005	4.5	1.00	4.5	0.54	8.06					4.33	0.00	0.00	0.00		4.33			
9/28/2005	4.5	1.00	4.5	0.64	5.97					4.21	0.00	0.00	0.00		4.21			
10/28/2005	4.5	1.00	4.5	0.87	3.74					4.30	0.00	0.00	0.00		4.30			
11/28/2005	4.5	1.00	4.5	0.58	0.87					4.60	0.00	0.00	0.00		4.60			
12/28/2005	4.5	1.00	4.5	0.59	0.00					4.95	0.00	0.00	0.00		4.95			
1/28/2006	4.5	1.00	4.5	0.56	0.00					5.29	0.00	0.00	0.00		5.29			
2/28/2006	4.5	1.00	4.5	0.62	0.00					5.61	0.00	0.00	0.00		5.61			
3/28/2006	4.5	1.00	4.5	0.85	0.00					5.93	0.00	0.00	0.00		5.93			
4/28/2006	4.5	1.00	4.5	0.84	4.71					5.84	0.00	0.00	0.00		5.84			
5/28/2006	4.5	1.00	4.5	0.90	6.54					5.60	0.00	0.00	0.00		5.60			
6/28/2006	4.5	1.00	4.5	0.50	8.34					5.20	0.00	0.00	0.00		5.20			
7/28/2006	4.5	1.00	4.5	0.40	9.42					4.72	0.00	0.00	0.00		4.72			
8/28/2006	4.5	1.00	4.5	0.54	8.06					4.40	0.00	0.00	0.00		4.40			
9/28/2006	4.5	1.00	4.5	0.64	5.97					4.28	0.00	0.00	0.00		4.28			
10/28/2006	4.5	1.00	4.5	0.87	3.74					4.36	0.00	0.00	0.00		4.36			
11/28/2006	4.5	1.00	4.5	0.58	0.87					4.66	0.00	0.00	0.00		4.66			
12/28/2006	4.5	1.00	4.5	0.59	0.00					5.02	0.00	0.00	0.00		5.02			
1/28/2007	4.6	1.00	4.6	0.56	0.00					5.35	0.00	0.00	0.00		5.35			
2/28/2007	4.6	1.00	4.6	0.62	0.00					5.67	0.00	0.00	0.00		5.67			
3/28/2007	4.6	1.00	4.6	0.85	0.00					5.99	0.00	0.00	0.00		5.99			
4/28/2007	4.6	1.00	4.6	0.84	4.71					5.90	0.00	0.00	0.00		5.90			
5/28/2007	4.6	1.00	4.6	0.90	6.54					5.67	0.00	0.00	0.00		5.67			
6/28/2007	4.6	1.00	4.6	0.50	8.34					5.27	0.00	0.00	0.00		5.27			
7/28/2007	4.6	1.00	4.6	0.40	9.42					4.79	0.00	0.00	0.00		4.79			
8/28/2007	4.6	1.00	4.6	0.54	8.06					4.47	0.00	0.00	0.00		4.47			
9/28/2007	4.6	1.00	4.6	0.64	5.97					4.34	0.00	0.00	0.00		4.34			
10/28/2007	4.6	1.00	4.6	0.87	3.74					4.43	0.00	0.00	0.00		4.43			
11/28/2007	4.6	1.00	4.6	0.58	0.87					4.73	0.00	0.00	0.00		4.73			
12/28/2007	4.6	1.00	4.6	0.59	0.00					5.08	0.00	0.00	0.00		5.08			
1/28/2008	4.6	1.00	4.6	0.56	0.00					5.42	0.00	0.00	0.00		5.42			
2/28/2008	4.6	1.00	4.6	0.62	0.00					5.74	0.00	0.00	0.00		5.74			
3/28/2008	4.6	1.00	4.6	0.85	0.00					6.06	0.00	0.00	0.00		6.06			
4/28/2008	4.6	1.00	4.6	0.84	4.71					5.97	0.00	0.00	0.00		5.97			
5/28/2008	4.6	1.00	4.6	0.90	6.54					5.74	0.00	0.00	0.00		5.74			
6/28/2008	4.6	1.00	4.6	0.50	8.34					5.34	0.00	0.00	0.00		5.34			
7/28/2008	4.6	1.00	4.6	0.40	9.42					4.86	0.00	0.00	0.00		4.86			
8/28/2008	4.6	1.00	4.6	0.54	8.06					4.53	0.00	0.00	0.00		4.53			
9/28/2008	4.6	1.00	4.6	0.64	5.97					4.41	0.00	0.00	0.00		4.41			
10/28/2008	4.6	1.00	4.6	0.87	3.74					4.50	0.00	0.00	0.00		4.50			
11/28/2008	4.6	1.00	4.6	0.58	0.87					4.80	0.00	0.00	0.00		4.80			
12/28/2008	4.6	1.00	4.6	0.59	0.00					5.15	0.00	0.00	0.00		5.15			
1/28/2009	4.6	1.00	4.6	0.56	0.00					5.49	0.00	0.00	0.00		5.49			
2/28/2009	4.6	1.00	4.6	0.62	0.00					5.81	0.00	0.00	0.00		5.81			
3/28/2009	4.6	1.00	4.6	0.85	0.00					6.13	0.00	0.00	0.00		6.13			
4/28/2009	4.6	1.00	4.6	0.84	4.71					6.04	0.00	0.00	0.00		6.04			
5/28/2009	4.6	1.00	4.6	0.90	6.54					5.81	0.00	0.00	0.00		5.81			
6/28/2009	4.6	1.00	4.6	0.50	8.34					5.40	0.00	0.00	0.00		5.40			
7/28/2009	4.6	1.00	4.6	0.40	9.42					4.93	0.00	0.00	0.00		4.93			
8/28/2009	4.6	1.00	4.6	0.54	8.06					4.60	0.00	0.00	0.00		4.60			
9/28/2009	4.6	1.00	4.6	0.64	5.97					4.48	0.00	0.00	0.00		4.48			
10/28/2009	4.6	1.00	4.6	0.87	3.74					4.57	0.00	0.00	0.00		4.57			
11/28/2009	4.6	1.00	4.6	0.58	0.87					4.86	0.00	0.00	0.00		4.86			
12/28/2009	4.6	1.00	4.6	0.59	0.00					5.22	0.00	0.00	0.00		5.22			
1/28/2010	4.6	1.00	4.6	0.56	0.00					5.55	0.00	0.00	0.00		5.55			
2/28/2010	4.6	1.00	4.6	0.62	0.00					5.88	0.00	0.00	0.00		5.88			
3/28/2010	4.6	1.00	4.6	0.85	0.00					6.20	0.00	0.00	0.00		6.20			
4/28/2010	4.6	1.00	4.6	0.84	4.71					6.11	0.00	0.00	0.00		6.11			
5/28/2010	4.6	1.00	4.6	0.90	6.54					5.87	0.00	0.00	0.00		5.87			
6/28/2010	4.6	1.00	4.6	0.50	8.34					5.47	0.00							

[illegible]

[illegible]

5/28/2066	#N/A	1.00	#N/A	0.84	4.71						6.01	#N/A	#N/A				6.01		
5/28/2066	#N/A	1.00	#N/A	0.90	6.54						6.01	#N/A	#N/A				6.01		
6/28/2066	#N/A	1.00	#N/A	0.50	8.34						6.01	#N/A	#N/A				6.01		
7/28/2066	#N/A	1.00	#N/A	0.40	9.42						6.01	#N/A	#N/A				6.01		
8/28/2066	#N/A	1.00	#N/A	0.54	8.06						6.01	#N/A	#N/A				6.01		
9/28/2066	#N/A	1.00	#N/A	0.64	5.97						6.01	#N/A	#N/A				6.01		
10/28/2066	#N/A	1.00	#N/A	0.87	3.74						6.01	#N/A	#N/A				6.01		
11/28/2066	#N/A	1.00	#N/A	0.58	6.87						6.01	#N/A	#N/A				6.01		
12/28/2066	#N/A	1.00	#N/A	0.59	0.00						6.01	#N/A	#N/A				6.01		
1/28/2067	#N/A	1.00	#N/A	0.56	0.00						6.01	#N/A	#N/A				6.01		
2/28/2067	#N/A	1.00	#N/A	0.62	0.00						6.01	#N/A	#N/A				6.01		
3/28/2067	#N/A	1.00	#N/A	0.85	0.00						6.01	#N/A	#N/A				6.01		
4/28/2067	#N/A	1.00	#N/A	0.84	4.71						6.01	#N/A	#N/A				6.01		
5/28/2067	#N/A	1.00	#N/A	0.90	6.54						6.01	#N/A	#N/A				6.01		
6/28/2067	#N/A	1.00	#N/A	0.50	8.34						6.01	#N/A	#N/A				6.01		
7/28/2067	#N/A	1.00	#N/A	0.40	9.42						6.01	#N/A	#N/A				6.01		
8/28/2067	#N/A	1.00	#N/A	0.54	8.06						6.01	#N/A	#N/A				6.01		
9/28/2067	#N/A	1.00	#N/A	0.64	5.97						6.01	#N/A	#N/A				6.01		
10/28/2067	#N/A	1.00	#N/A	0.87	3.74						6.01	#N/A	#N/A				6.01		
11/28/2067	#N/A	1.00	#N/A	0.58	6.87						6.01	#N/A	#N/A				6.01		
12/28/2067	#N/A	1.00	#N/A	0.59	0.00						6.01	#N/A	#N/A				6.01		
1/28/2068	#N/A	1.00	#N/A	0.56	0.00						6.01	#N/A	#N/A				6.01		
2/28/2068	#N/A	1.00	#N/A	0.62	0.00						6.01	#N/A	#N/A				6.01		
3/28/2068	#N/A	1.00	#N/A	0.85	0.00						6.01	#N/A	#N/A				6.01		
4/28/2068	#N/A	1.00	#N/A	0.84	4.71						6.01	#N/A	#N/A				6.01		
5/28/2068	#N/A	1.00	#N/A	0.90	6.54						6.01	#N/A	#N/A				6.01		
6/28/2068	#N/A	1.00	#N/A	0.50	8.34						6.01	#N/A	#N/A				6.01		
7/28/2068	#N/A	1.00	#N/A	0.40	9.42						6.01	#N/A	#N/A				6.01		
8/28/2068	#N/A	1.00	#N/A	0.54	8.06						6.01	#N/A	#N/A				6.01		
9/28/2068	#N/A	1.00	#N/A	0.64	5.97						6.01	#N/A	#N/A				6.01		
10/28/2068	#N/A	1.00	#N/A	0.87	3.74						6.01	#N/A	#N/A				6.01		
11/28/2068	#N/A	1.00	#N/A	0.58	6.87						6.01	#N/A	#N/A				6.01		
12/28/2068	#N/A	1.00	#N/A	0.59	0.00						6.01	#N/A	#N/A				6.01		
1/28/2069	#N/A	1.00	#N/A	0.56	0.00						6.01	#N/A	#N/A				6.01		
2/28/2069	#N/A	1.00	#N/A	0.62	0.00						6.01	#N/A	#N/A				6.01		
3/28/2069	#N/A	1.00	#N/A	0.85	0.00						6.01	#N/A	#N/A				6.01		
4/28/2069	#N/A	1.00	#N/A	0.84	4.71						6.01	#N/A	#N/A				6.01		
5/28/2069	#N/A	1.00	#N/A	0.90	6.54						6.01	#N/A	#N/A				6.01		
6/28/2069	#N/A	1.00	#N/A	0.50	8.34						6.01	#N/A	#N/A				6.01		
7/28/2069	#N/A	1.00	#N/A	0.40	9.42						6.01	#N/A	#N/A				6.01		
8/28/2069	#N/A	1.00	#N/A	0.54	8.06						6.01	#N/A	#N/A				6.01		
9/28/2069	#N/A	1.00	#N/A	0.64	5.97						6.01	#N/A	#N/A				6.01		
10/28/2069	#N/A	1.00	#N/A	0.87	3.74						6.01	#N/A	#N/A				6.01		
11/28/2069	#N/A	1.00	#N/A	0.58	6.87						6.01	#N/A	#N/A				6.01		
12/28/2069	#N/A	1.00	#N/A	0.59	0.00						6.01	#N/A	#N/A				6.01		
1/28/2070	#N/A	1.00	#N/A	0.56	0.00						6.01	#N/A	#N/A				6.01		
2/28/2070	#N/A	1.00	#N/A	0.62	0.00						6.01	#N/A	#N/A				6.01		
3/28/2070	#N/A	1.00	#N/A	0.85	0.00						6.01	#N/A	#N/A				6.01		
4/28/2070	#N/A	1.00	#N/A	0.84	4.71						6.01	#N/A	#N/A				6.01		
5/28/2070	#N/A	1.00	#N/A	0.90	6.54						6.01	#N/A	#N/A				6.01		
6/28/2070	#N/A	1.00	#N/A	0.50	8.34						6.01	#N/A	#N/A				6.01		
7/28/2070	#N/A	1.00	#N/A	0.40	9.42						6.01	#N/A	#N/A				6.01		
8/28/2070	#N/A	1.00	#N/A	0.54	8.06						6.01	#N/A	#N/A				6.01		
9/28/2070	#N/A	1.00	#N/A	0.64	5.97						6.01	#N/A	#N/A				6.01		
10/28/2070	#N/A	1.00	#N/A	0.87	3.74						6.01	#N/A	#N/A				6.01		
11/28/2070	#N/A	1.00	#N/A	0.58	6.87						6.01	#N/A	#N/A				6.01		
12/28/2070	#N/A	1.00	#N/A	0.59	0.00						#N/A	#N/A	#N/A				#N/A		
1/28/2071	#N/A	1.00	#N/A	0.56	0.00						#N/A	#N/A	#N/A				#N/A		
2/28/2071	#N/A	1.00	#N/A	0.62	0.00						#N/A	#N/A	#N/A				#N/A		
3/28/2071	#N/A	1.00	#N/A	0.85	0.00						#N/A	#N/A	#N/A				#N/A		
4/28/2071	#N/A	1.00	#N/A	0.84	4.71						#N/A	#N/A	#N/A				#N/A		
5/28/2071	#N/A	1.00	#N/A	0.90	6.54						#N/A	#N/A	#N/A				#N/A		
6/28/2071	#N/A	1.00	#N/A	0.50	8.34						#N/A	#N/A	#N/A				#N/A		
7/28/2071	#N/A	1.00	#N/A	0.40	9.42						#N/A	#N/A	#N/A				#N/A		
8/28/2071	#N/A	1.00	#N/A	0.54	8.06						#N/A	#N/A	#N/A				#N/A		
9/28/2071	#N/A	1.00	#N/A	0.64	5.97						#N/A	#N/A	#N/A				#N/A		
10/28/2071	#N/A	1.00	#N/A	0.87	3.74						#N/A	#N/A	#N/A				#N/A		
11/28/2071	#N/A	1.00	#N/A	0.58	6.87						#N/A	#N/A	#N/A				#N/A		
12/28/2071	#N/A	1.00	#N/A	0.59	0.00						#N/A	#N/A	#N/A				#N/A		
1/28/2072	#N/A	1.00	#N/A	0.56	0.00						#N/A	#N/A	#N/A				#N/A		
2/28/2072	#N/A	1.00	#N/A	0.62	0.00						#N/A	#N/A	#N/A				#N/A		
3/28/2072	#N/A	1.00	#N/A	0.85	0.00						#N/A	#N/A	#N/A				#N/A		
4/28/2072	#N/A	1.00	#N/A	0.84	4.71						#N/A	#N/A	#N/A				#N/A		
5/28/2072	#N/A	1.00	#N/A	0.90	6.54						#N/A	#N/A							
6/28/2072	#N/A	1.00	#N/A	0.50	8.34						#N/A	#N/A	#N/A						
7/28/2072	#N/A	1.00	#N/A	0.40	9.42						#N/A	#N/A	#N/A						
8/28/2072	#N/A	1.00	#N/A	0.54	8.06						#N/A	#N/A	#N/A						
9/28/2072	#N/A	1.00	#N/A	0.64	5.97						#N/A	#N/A							
10/28/2072	#N/A	1.00	#N/A	0.87	3.74						#N/A								
11/28/2072	#N/A	1.00	#N/A	0.58	6.87						#N/A	#N/A	#N/A						
12/28/2072	#N/A	1.00	#N/A	0.59	0.00						#N/A								
1/28/2073	#N/A	1.00	#N/A	0.56	0.00						#N/A								
2/28/2073	#N/A	1.00	#N/A	0.62	0.00						#N/A								
3/28/2073	#N/A	1.00	#N/A	0.85	0.00						#N/A								
4/28/2073	#N/A	1.00	#N/A	0.84	4.71						#N/A								
5/28/2073	#N/A	1.00	#N/A	0.90	6.54						#N/A								
6/28/2073	#N/A	1.00	#N/A	0.50	8.34						#N/A								
7/28/2073	#N/A	1.00	#N/A	0.40	9.42						#N/A								
8/28/2073	#N/A	1.00	#N/A	0.54	8.06						#N/A								
9/28/2073	#N/A	1.00	#N/A	0.64	5.97						#N/A								
10/28/2073	#N/A	1.00	#N/A	0.87	3.74						#N/A								
11/28/2073	#N/A	1.00	#N/A	0.58	6.87						#N/A								
12/28/2073	#N/A	1.00	#N/A	0.59	0.00						#N/A								
1/28/2074	#N/A	1.00	#N/A	0.56	0.00						#N/A								
2/28/2074	#N/A	1.00	#N/A	0.62	0.00						#N/A								
3/28/2074	#N/A	1.00	#N/A	0.85	0.00						#N/A								
4/28/2074	#N/A	1.00	#N/A	0.84	4.71														

APPENDIX G. WATER BALANCE RESULTS: LAGOON OPERATION FOR MINIMAL GROWTH

Current Year		2023			
Equivalent Population:		8403		8403	
Inflow per Population Equip:				gal/day	
Month		Normal Precip (in.)	Average Pan Evap. (in.)	Average Lagoon Evap. (in.)	Pan Coefficient
Jan	1	0.56	0.00	0.00	0.75
Feb	2	0.62	0.00	0.00	
Mar	3	0.85	0.00	0.00	
Apr	4	0.84	6.29	4.71	
May	5	0.9	8.73	6.54	
Jun	6	0.5	11.12	8.34	
Jul	7	0.4	12.56	9.42	
Aug	8	0.54	10.75	8.06	
Sep	9	0.64	7.96	5.97	
Oct	10	0.87	4.99	3.74	
Nov	11	0.58	1.16	0.87	
Dec	12	0.59	0.00	0.00	

44895.00

8403

20

With smith meat 18 years

Time to Fill Primary Cell 1 year
Time to fill Primary & 1st Secondary 2 years
Time to fill primary & 2 secondaries 18-20 years
Time to fill primary & 3 secondaries 40 years

Year	Flow Increase Factor
2018	0%
2020	0%
2030	0%
2040	0%
2050	0%
2060	0%

68.88384596
41.24569399
39.06239325

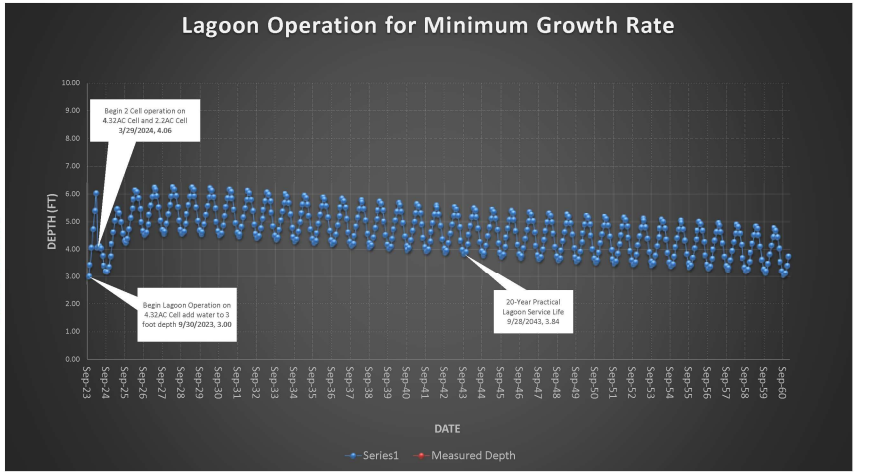
45199.00

5.857636364

0.000000488

If Discharging Lagoons, is Chlorination used?	No	Calc only after inputs are done, otherwise leave on "No"			
Calculate Detention Time	No				
Apply Population Growth	Yes				
		Pond 1	Pond 2	Pond 3	Pond 4
Primary/Secondary		Primary	Secondary	Secondary	Secondary
Lagoon Area Bottom-		4.3	2.2	7.17	0
Lagoon Maximum Allowable Depth		6	6	6	6
Lagoon Starting Depth		0	0	0	0
Hydraulic Conductivity		6.0E-07	3.0E-07	6.7E-07	6.7E-07
Hydraulic Conductivity		5.2E-02	2.6E-02	0.057767717	0.057767717
Liner Thickness		1	1	1	1
Year Seepage Exceeds State Max (6500 gal/ac/day)		#N/A	#N/A	#N/A	#N/A

MONTHLY INFLOW	Monthly Inflow (AC, FT)	Monthly Inflow Factor	Altered Monthly Inflow (Ac, Ft)	Average Precipitation (INCH, FT)	Average Evaporation (INCH, FT)	Available Storage Pond 1	MONTHLY SEEPAGE VOLUME Pond 1
DATE	Monthly Inflow (AC, FT)	Monthly Inflow Factor	Altered Monthly Inflow (Ac, Ft)	Average Precipitation (INCH, FT)	Average Evaporation (INCH, FT)		
9/30/2023	3.8	1.00	3.8	0.64	6.0		
10/30/2023	3.8	1.00	3.8	0.87	3.74		
11/30/2023	3.8	1.00	3.8	0.58	0.87		
12/30/2023	3.8	1.00	3.8	0.59	0.00		
1/30/2024	3.9	1.00	3.9	0.56	0.00		
2/29/2024	3.9	1.00	3.9	0.62	0.00		
3/29/2024	3.9	1.00	3.9	0.85	0.00		
4/29/2024	3.9	1.00	3.9	0.84	4.11		
5/29/2024	3.9	1.00	3.9	0.90	6.54		
6/29/2024	3.9	1.00	3.9	0.50	8.34		
7/29/2024	3.9	1.00	3.9	0.40	9.42		
8/29/2024	3.9	1.00	3.9	0.54	8.06		
9/29/2024	3.9	1.00	3.9	0.64	5.97		
10/29/2024	3.9	1.00	3.9	0.87	3.74		
11/29/2024	3.9	1.00	3.9	0.58	0.87		
12/29/2024	3.9	1.00	3.9	0.59	0.00		
1/29/2025	3.9	1.00	3.9	0.56	0.00		
2/28/2025	3.9	1.00	3.9	0.62	0.00		
3/28/2025	3.9	1.00	3.9	0.85	0.00		
4/28/2025	3.9	1.00	3.9	0.84	4.71		
5/28/2025	3.9	1.00	3.9	0.90	6.54		
6/28/2025	3.9	1.00	3.9	0.50	8.34		
7/28/2025	3.9	1.00	3.9	0.40	9.42		
8/28/2025	3.9	1.00	3.9	0.54	8.06		
9/28/2025	3.9	1.00	3.9	0.64	5.97		
10/28/2025	3.9	1.00	3.9	0.87	3.74		
11/28/2025	3.9	1.00	3.9	0.58	0.87		
12/28/2025	3.9	1.00	3.9	0.59	0.00		
1/28/2026	3.6	1.00	3.6	0.56	0.00		
2/28/2026	3.6	1.00	3.6	0.62	0.00		
3/28/2026	3.6	1.00	3.6	0.85	0.00		
4/28/2026	3.6	1.00	3.6	0.84	4.71		
5/28/2026	3.6	1.00	3.6	0.90	6.54		
6/28/2026	3.6	1.00	3.6	0.50	8.34		
7/28/2026	3.6	1.00	3.6	0.40	9.42		
8/28/2026	3.6	1.00	3.6	0.54	8.06		
9/28/2026	3.6	1.00	3.6	0.64	5.97		
10/28/2026	3.6	1.00	3.6	0.87	3.74		
11/28/2026	3.6	1.00	3.6	0.58	0.87		
12/28/2026	3.6	1.00	3.6	0.59	0.00		
1/28/2027	3.6	1.00	3.6	0.56	0.00		
2/28/2027	3.6	1.00	3.6	0.62	0.00		
3/28/2027	3.6	1.00	3.6	0.85	0.00		
4/28/2027	3.6	1.00	3.6	0.84	4.71		
5/28/2027	3.6	1.00	3.6	0.90	6.54		
6/28/2027	3.6	1.00	3.6	0.50	8.34		
7/28/2027	3.6	1.00	3.6	0.40	9.42		
8/28/2027	3.6	1.00	3.6	0.54	8.06		
9/28/2027	3.6	1.00	3.6	0.64	5.97		
10/28/2027	3.6	1.00	3.6	0.87	3.74		
11/28/2027	3.6	1.00	3.6	0.58	0.87		
12/28/2027	3.6	1.00	3.6	0.59	0.00		
1/28/2028	3.6	1.00	3.6	0.56	0.00		
2/28/2028	3.6	1.00	3.6	0.62	0.00		
3/28/2028	3.6	1.00	3.6	0.85	0.00		
4/28/2028	3.6	1.00	3.6	0.84	4.71		
5/28/2028	3.6	1.00	3.6	0.90	6.54		
6/28/2028	3.6	1.00	3.6	0.50	8.34		
7/28/2028	3.6	1.00	3.6	0.40	9.42		
8/28/2028	3.6	1.00	3.6	0.54	8.06		
9/28/2028	3.6	1.00	3.6	0.64	5.97		
10/28/2028	3.6	1.00	3.6	0.87	3.74		
11/28/2028	3.6	1.00	3.6	0.58	0.87		
12/28/2028	3.6	1.00	3.6	0.59	0.00		
1/28/2029	3.6	1.00	3.6	0.56	0.00		



if neautive inflows, then more evaporation than reein and outflow from tree

1st pond depth	Operation on Pond 1 and 2	Operation on All 3 Ponds	4th Pond	Average Active Cell Depth	Measured Depths
3.00	0.00	0.00		3.00	
3.43	0.00	0.00		3.43	
4.00	0.00	0.00		4.06	
4.73	0.00	0.00		4.73	
5.39	0.00	0.00		5.39	
6.02	3.50	0.00		6.02	
6.64	4.06	0.00		4.06	
6.83	4.12	0.00		4.12	
6.86	4.04	0.00		4.04	
6.71	3.77	0.00		3.77	
6.01	3.41	0.00		3.41	
6.01	3.20	0.00		3.20	
6.01	3.18	0.00		3.18	
6.01	3.36	0.00		3.36	
6.01	3.75	0.00		3.75	
6.01	4.20	0.00		4.20	
6.01	4.62	0.00		4.62	
6.01	5.03	0.00		5.03	
6.01	5.45	0.00		5.45	
6.01	5.45	0.00		5.45	
6.01	5.31	0.00		5.31	
6.01	4.98	0.00		4.98	
6.01	4.58	0.00		4.58	
6.01	4.31	0.00		4.31	
6.01	4.24	0.00		4.24	
6.01	4.38	0.00		4.38	
6.01	4.73	0.00		4.73	
6.01	5.13	0.00		5.13	
6.01	5.47	0.00		5.47	
6.01	5.80	0.00		5.80	
6.01	6.14	2.53		6.14	
6.01	6.07	2.39		6.07	
6.01	5.85	0.00		5.85	
6.01	5.46	0.00		5.46	
6.01	4.99	0.00		4.99	
6.01	4.66	0.00		4.66	
6.01	4.53	0.00		4.53	
6.01	4.61	0.00		4.61	
6.01	4.90	0.00		4.90	
6.01	5.25	0.00		5.25	
6.01	5.58	0.00		5.58	
6.01	5.90	0.00		5.90	
6.01	6.23	2.57		6.23	
6.01	6.15	2.42		6.15	
6.01	5.92	0.00		5.92	
6.01	5.82	0.00		5.82	
6.01	5.04	0.00		5.04	
6.01	4.71	0.00		4.71	
6.01	4.57	0.00		4.57	
6.01	4.64	0.00		4.64	
6.01	4.93	0.00		4.93	
6.01	5.27	0.00		5.27	
6.01	5.59	0.00		5.59	

[illegible]

[illegible]

1/28/2048	3.3	1.00	3.3	0.59	0.00	6.01	4.30	0.00	4.30
1/28/2049	3.3	1.00	3.3	0.56	0.00	6.01	4.62	0.00	4.62
2/28/2049	3.3	1.00	3.3	0.62	0.00	6.01	4.94	0.00	4.94
3/28/2049	3.3	1.00	3.3	0.85	0.00	6.01	5.26	0.00	5.26
4/28/2049	3.3	1.00	3.3	0.84	4.71	6.01	5.17	0.00	5.17
5/28/2049	3.3	1.00	3.3	0.90	6.54	6.01	4.94	0.00	4.94
6/28/2049	3.3	1.00	3.3	0.50	8.34	6.01	4.54	0.00	4.54
7/28/2049	3.3	1.00	3.3	0.40	9.42	6.01	4.05	0.00	4.05
8/28/2049	3.3	1.00	3.3	0.54	8.06	6.01	3.71	0.00	3.71
9/28/2049	3.3	1.00	3.3	0.64	5.97	6.01	3.57	0.00	3.57
10/28/2049	3.3	1.00	3.3	0.87	3.74	6.01	3.14	0.00	3.14
11/28/2049	3.3	1.00	3.3	0.58	0.87	6.01	3.92	0.00	3.92
12/28/2049	3.3	1.00	3.3	0.59	0.00	6.01	4.26	0.00	4.26
1/28/2050	3.3	1.00	3.3	0.56	0.00	6.01	4.59	0.00	4.59
2/28/2050	3.3	1.00	3.3	0.62	0.00	6.01	4.90	0.00	4.90
3/28/2050	3.3	1.00	3.3	0.85	0.00	6.01	5.22	0.00	5.22
4/28/2050	3.3	1.00	3.3	0.84	4.71	6.01	5.13	0.00	5.13
5/28/2050	3.3	1.00	3.3	0.90	6.54	6.01	4.90	0.00	4.90
6/28/2050	3.3	1.00	3.3	0.50	8.34	6.01	4.50	0.00	4.50
7/28/2050	3.3	1.00	3.3	0.40	9.42	6.01	4.01	0.00	4.01
8/28/2050	3.3	1.00	3.3	0.54	8.06	6.01	3.68	0.00	3.68
9/28/2050	3.3	1.00	3.3	0.64	5.97	6.01	3.53	0.00	3.53
10/28/2050	3.3	1.00	3.3	0.87	3.74	6.01	3.60	0.00	3.60
11/28/2050	3.3	1.00	3.3	0.58	0.87	6.01	3.88	0.00	3.88
12/28/2050	3.3	1.00	3.3	0.59	0.00	6.01	4.23	0.00	4.23
1/28/2051	3.3	1.00	3.3	0.56	0.00	6.01	4.55	0.00	4.55
2/28/2051	3.3	1.00	3.3	0.62	0.00	6.01	4.86	0.00	4.86
3/28/2051	3.3	1.00	3.3	0.85	0.00	6.01	5.18	0.00	5.18
4/28/2051	3.3	1.00	3.3	0.84	4.71	6.01	5.10	0.00	5.10
5/28/2051	3.3	1.00	3.3	0.90	6.54	6.01	4.87	0.00	4.87
6/28/2051	3.3	1.00	3.3	0.50	8.34	6.01	4.46	0.00	4.46
7/28/2051	3.3	1.00	3.3	0.40	9.42	6.01	3.98	0.00	3.98
8/28/2051	3.3	1.00	3.3	0.54	8.06	6.01	3.64	0.00	3.64
9/28/2051	3.3	1.00	3.3	0.64	5.97	6.01	3.50	0.00	3.50
10/28/2051	3.3	1.00	3.3	0.87	3.74	6.01	3.57	0.00	3.57
11/28/2051	3.3	1.00	3.3	0.58	0.87	6.01	3.85	0.00	3.85
12/28/2051	3.3	1.00	3.3	0.59	0.00	6.01	4.19	0.00	4.19
1/28/2052	3.3	1.00	3.3	0.56	0.00	6.01	4.51	0.00	4.51
2/28/2052	3.3	1.00	3.3	0.62	0.00	6.01	4.83	0.00	4.83
3/28/2052	3.3	1.00	3.3	0.85	0.00	6.01	5.15	0.00	5.15
4/28/2052	3.3	1.00	3.3	0.84	4.71	6.01	5.06	0.00	5.06
5/28/2052	3.3	1.00	3.3	0.90	6.54	6.01	4.83	0.00	4.83
6/28/2052	3.3	1.00	3.3	0.50	8.34	6.01	4.43	0.00	4.43
7/28/2052	3.3	1.00	3.3	0.40	9.42	6.01	3.94	0.00	3.94
8/28/2052	3.3	1.00	3.3	0.54	8.06	6.01	3.60	0.00	3.60
9/28/2052	3.3	1.00	3.3	0.64	5.97	6.01	3.46	0.00	3.46
10/28/2052	3.3	1.00	3.3	0.87	3.74	6.01	3.53	0.00	3.53
11/28/2052	3.3	1.00	3.3	0.58	0.87	6.01	3.81	0.00	3.81
12/28/2052	3.3	1.00	3.3	0.59	0.00	6.01	4.15	0.00	4.15
1/28/2053	3.2	1.00	3.2	0.56	0.00	6.01	4.48	0.00	4.48
2/28/2053	3.2	1.00	3.2	0.62	0.00	6.01	4.79	0.00	4.79
3/28/2053	3.2	1.00	3.2	0.85	0.00	6.01	5.11	0.00	5.11
4/28/2053	3.2	1.00	3.2	0.84	4.71	6.01	5.03	0.00	5.03
5/28/2053	3.2	1.00	3.2	0.90	6.54	6.01	4.80	0.00	4.80
6/28/2053	3.2	1.00	3.2	0.50	8.34	6.01	4.39	0.00	4.39
7/28/2053	3.2	1.00	3.2	0.40	9.42	6.01	3.91	0.00	3.91
8/28/2053	3.2	1.00	3.2	0.54	8.06	6.01	3.57	0.00	3.57
9/28/2053	3.2	1.00	3.2	0.64	5.97	6.01	3.43	0.00	3.43
10/28/2053	3.2	1.00	3.2	0.87	3.74	6.01	3.50	0.00	3.50
11/28/2053	3.2	1.00	3.2	0.58	0.87	6.01	3.78	0.00	3.78
12/28/2053	3.2	1.00	3.2	0.59	0.00	6.01	4.12	0.00	4.12
1/28/2054	3.2	1.00	3.2	0.56	0.00	6.01	4.44	0.00	4.44
2/28/2054	3.2	1.00	3.2	0.62	0.00	6.01	4.76	0.00	4.76
3/28/2054	3.2	1.00	3.2	0.85	0.00	6.01	5.08	0.00	5.08
4/28/2054	3.2	1.00	3.2	0.84	4.71	6.01	4.99	0.00	4.99
5/28/2054	3.2	1.00	3.2	0.90	6.54	6.01	4.76	0.00	4.76
6/28/2054	3.2	1.00	3.2	0.50	8.34	6.01	4.36	0.00	4.36
7/28/2054	3.2	1.00	3.2	0.40	9.42	6.01	3.87	0.00	3.87
8/28/2054	3.2	1.00	3.2	0.54	8.06	6.01	3.53	0.00	3.53
9/28/2054	3.2	1.00	3.2	0.64	5.97	6.01	3.39	0.00	3.39
10/28/2054	3.2	1.00	3.2	0.87	3.74	6.01	3.46	0.00	3.46
11/28/2054	3.2	1.00	3.2	0.58	0.87	6.01	3.74	0.00	3.74
12/28/2054	3.2	1.00	3.2	0.59	0.00	6.01	4.08	0.00	4.08
1/28/2055	3.2	1.00	3.2	0.56	0.00	6.01	4.41	0.00	4.41
2/28/2055	3.2	1.00	3.2	0.62	0.00	6.01	4.72	0.00	4.72
3/28/2055	3.2	1.00	3.2	0.85	0.00	6.01	5.04	0.00	5.04
4/28/2055	3.2	1.00	3.2	0.84	4.71	6.01	4.95	0.00	4.95
5/28/2055	3.2	1.00	3.2	0.90	6.54	6.01	4.72	0.00	4.72
6/28/2055	3.2	1.00	3.2	0.50	8.34	6.01	4.32	0.00	4.32
7/28/2055	3.2	1.00	3.2	0.40	9.42	6.01	3.83	0.00	3.83
8/28/2055	3.2	1.00	3.2	0.54	8.06	6.01	3.49	0.00	3.49
9/28/2055	3.2	1.00	3.2	0.64	5.97	6.01	3.35	0.00	3.35
10/28/2055	3.2	1.00	3.2	0.87	3.74	6.01	3.42	0.00	3.42
11/28/2055	3.2	1.00	3.2	0.58	0.87	6.01	3.70	0.00	3.70
12/28/2055	3.2	1.00	3.2	0.59	0.00	6.01	4.04	0.00	4.04
1/28/2056	3.2	1.00	3.2	0.56	0.00	6.01	4.37	0.00	4.37
2/28/2056	3.2	1.00	3.2	0.62	0.00	6.01	4.68	0.00	4.68
3/28/2056	3.2	1.00	3.2	0.85	0.00	6.01	5.00	0.00	5.00
4/28/2056	3.2	1.00	3.2	0.84	4.71	6.01	4.91	0.00	4.91
5/28/2056	3.2	1.00	3.2	0.90	6.54	6.01	4.68	0.00	4.68
6/28/2056	3.2	1.00	3.2	0.50	8.34	6.01	4.28	0.00	4.28
7/28/2056	3.2	1.00	3.2	0.40	9.42	6.01	3.79	0.00	3.79
8/28/2056	3.2	1.00	3.2	0.54	8.06	6.01	3.45	0.00	3.45
9/28/2056	3.2	1.00	3.2	0.64	5.97	6.01	3.31	0.00	3.31
10/28/2056	3.2	1.00	3.2	0.87	3.74	6.01	3.38	0.00	3.38
11/28/2056	3.2	1.00	3.2	0.58	0.87	6.01	3.66	0.00	3.66
12/28/2056	3.2	1.00	3.2	0.59	0.00	6.01	4.00	0.00	4.00
1/28/2057	3.2	1.00	3.2	0.56	0.00	6.01	4.32	0.00	4.32
2/28/2057	3.2	1.00	3.2	0.62	0.00	6.01	4.63	0.00	4.63
3/28/2057	3.2	1.00	3.2	0.85	0.00	6.01	4.95	0.00	4.95
4/28/2057	3.2	1.00	3.2	0.84	4.71	6.01	4.86	0.00	4.86
5/28/2057	3.2	1.00	3.2	0.90	6.54	6.01	4.63	0.00	4.63
6/28/2057	3.2	1.00	3.2	0.50	8.34	6.01	4.23	0.00	4.23
7/28/2057	3.2	1.00	3.2	0.40	9.42	6.01	3.74	0.00	3.74
8/28/2057	3.2	1.00	3.2	0.54	8.06	6.01	3.40	0.00	3.40
9/28/2057	3.2	1.00	3.2	0.64	5.97	6.01	3.26	0.00	3.26
10/28/2057	3.2	1.00	3.2	0.87	3.74	6.01	3.32	0.00	3.32
11/28/2057	3.2	1.00	3.2	0.58	0.87	6.01	3.60	0.00	3.60
12/28/2057	3.2	1.00	3.2	0.59	0.00	6.01	3.95	0.00	3.95
1/28/2058	3.2	1.00	3.2	0.56	0.00	6.01	4.27	0.00	4.27
2/28/2058	3.2	1.00	3.2	0.62	0.00	6.01	4.58	0.00	4.58
3/28/2058	3.2	1.00	3.2	0.85	0.00	6.01	4.90	0.00	4.90
4/28/2058	3.2	1.00	3.2	0.84	4.71	6.01	4.81	0.00	4.81
5/28/2058	3.2	1.00	3.2	0.90	6.54	6.01	4.58	0.00	4.58
6/28/2058	3.2	1.00	3.2	0.50	8.34	6.01	4.17	0.00	4.17
7/28/2058	3.2	1.00	3.2	0.40	9.42	6.01	3.68	0.00	3.68
8/28/2058	3.2	1.00	3.2	0.54	8.06	6.01	3.34	0.00	3.34
9/28/2058	3.2	1.00	3.2	0.64	5.97	6.01	3.20	0.00	3.20
10/28/2058	3.2	1.00	3.2	0.87	3.74	6.01	3.27	0.00	3.27

12/28/2058	3.2	1.00	3.2	0.58	0.87	6.01	3.55	0.00	3.55	0
12/28/2058	3.2	1.00	3.2	0.59	0.80	6.01	3.89	0.00	3.89	0
1/28/2059	3.1	1.00	3.1	0.56	0.80	6.01	4.21	0.00	4.21	0
2/28/2059	3.1	1.00	3.1	0.62	0.80	6.01	4.52	0.00	4.52	0
3/28/2059	3.1	1.00	3.1	0.85	0.00	6.01	4.84	0.00	4.84	0
4/28/2059	3.1	1.00	3.1	0.84	4.71	6.01	4.75	0.00	4.75	0
5/28/2059	3.1	1.00	3.1	0.90	6.54	6.01	4.51	0.00	4.51	0
6/28/2059	3.1	1.00	3.1	0.50	8.34	6.01	4.31	0.00	4.31	0
7/28/2059	3.1	1.00	3.1	0.40	9.42	6.01	3.62	0.00	3.62	0
8/28/2059	3.1	1.00	3.1	0.54	8.06	6.01	3.28	0.00	3.28	0
9/28/2059	3.1	1.00	3.1	0.64	5.97	6.01	3.13	0.00	3.13	0
10/28/2059	3.1	1.00	3.1	0.87	3.74	6.01	3.20	0.00	3.20	0
11/28/2059	3.1	1.00	3.1	0.58	0.87	6.01	3.48	0.00	3.48	0
12/28/2059	3.1	1.00	3.1	0.59	0.80	6.01	3.82	0.00	3.82	0
1/28/2060	3.1	1.00	3.1	0.56	0.80	6.01	4.14	0.00	4.14	0
2/28/2060	3.1	1.00	3.1	0.62	0.80	6.01	4.45	0.00	4.45	0
3/28/2060	3.1	1.00	3.1	0.85	0.00	6.01	4.77	0.00	4.77	0
4/28/2060	3.1	1.00	3.1	0.84	4.71	6.01	4.68	0.00	4.68	0
5/28/2060	3.1	1.00	3.1	0.90	6.54	6.01	4.44	0.00	4.44	0
6/28/2060	3.1	1.00	3.1	0.50	8.34	6.01	4.83	0.00	4.83	0
7/28/2060	3.1	1.00	3.1	0.40	9.42	6.01	3.55	0.00	3.55	0
8/28/2060	3.1	1.00	3.1	0.54	8.06	6.01	3.20	0.00	3.20	0
9/28/2060	3.1	1.00	3.1	0.64	5.97	6.01	3.86	0.00	3.86	0
10/28/2060	3.1	1.00	3.1	0.87	3.74	6.01	3.13	0.00	3.13	0
11/28/2060	3.1	1.00	3.1	0.58	0.87	6.01	3.40	0.00	3.40	0
12/28/2060	3.1	1.00	3.1	0.59	0.80	6.01	3.74	0.00	3.74	0
1/28/2061	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2061	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2061	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2061	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2061	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2061	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2061	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2061	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2061	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2061	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2061	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2061	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2062	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2062	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2062	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2062	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2062	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2062	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2062	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2062	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2062	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2062	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2062	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2062	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2063	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2063	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2063	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2063	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2063	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2063	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2063	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2063	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2063	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2063	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2063	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2063	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2064	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2064	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2064	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2064	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2064	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2064	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2064	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2064	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2064	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2064	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2064	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2064	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2065	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2065	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2065	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2065	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2065	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2065	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2065	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2065	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2065	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2065	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2065	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2065	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2066	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2066	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2066	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2066	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2066	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2066	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2066	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2066	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2066	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2066	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2066	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2066	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2067	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2067	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2067	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2067	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2067	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2067	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2067	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2067	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2067	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0
10/28/2067	#N/A	1.00	#N/A	0.87	3.74	#N/A	#N/A	#N/A	#N/A	0
11/28/2067	#N/A	1.00	#N/A	0.58	0.87	#N/A	#N/A	#N/A	#N/A	0
12/28/2067	#N/A	1.00	#N/A	0.59	0.80	#N/A	#N/A	#N/A	#N/A	0
1/28/2068	#N/A	1.00	#N/A	0.56	0.80	#N/A	#N/A	#N/A	#N/A	0
2/28/2068	#N/A	1.00	#N/A	0.62	0.80	#N/A	#N/A	#N/A	#N/A	0
3/28/2068	#N/A	1.00	#N/A	0.85	0.00	#N/A	#N/A	#N/A	#N/A	0
4/28/2068	#N/A	1.00	#N/A	0.84	4.71	#N/A	#N/A	#N/A	#N/A	0
5/28/2068	#N/A	1.00	#N/A	0.90	6.54	#N/A	#N/A	#N/A	#N/A	0
6/28/2068	#N/A	1.00	#N/A	0.50	8.34	#N/A	#N/A	#N/A	#N/A	0
7/28/2068	#N/A	1.00	#N/A	0.40	9.42	#N/A	#N/A	#N/A	#N/A	0
8/28/2068	#N/A	1.00	#N/A	0.54	8.06	#N/A	#N/A	#N/A	#N/A	0
9/28/2068	#N/A	1.00	#N/A	0.64	5.97	#N/A	#N/A	#N/A	#N/A	0

[illegible]

APPENDIX H. DATA REFERENCES

Table 0-1 Kem C. Gardner Growth Rate

Year	Year/Year Growth	Year (Cont)	Year/Year Growth (Cont)
2022	2.10%	2042	-0.40%
2023	5.90%	2043	-0.40%
2024	3.40%	2044	-0.40%
2025	0.10%	2045	-0.40%
2026	-7.60%	2046	-0.40%
2027	-0.90%	2047	-0.30%
2028	-0.30%	2048	-0.30%
2029	-0.40%	2049	-0.30%
2030	-0.50%	2050	-0.30%
2031	-0.50%	2051	-0.30%
2032	-0.50%	2052	-0.30%
2033	-0.50%	2053	-0.30%
2034	-0.50%	2054	-0.30%
2035	-0.40%	2055	-0.40%
2036	-0.40%	2056	-0.50%
2037	-0.40%	2057	-0.50%
2038	-0.40%	2058	-0.60%
2039	-0.40%	2059	-0.70%
2040	-0.40%	2060	-0.80%
2041	-0.40%		

Table 0-2 Maximum Growth Rate

Year	Maximum Possible Growth	Year (Cont)	Maximum Possible Growth (Cont)
2022	2%	2042	1.5%
2023	6%	2043	1.5%
2024	3%	2044	1.5%
2025	1.5%	2045	1.5%
2026	1.5%	2046	1.5%
2027	1.5%	2047	1.5%
2028	1.5%	2048	1.5%
2029	1.5%	2049	1.5%
2030	1.5%	2050	1.5%
2031	1.5%	2051	1.5%
2032	1.5%	2052	1.5%
2033	1.5%	2053	1.5%
2034	1.5%	2054	1.5%
2035	1.5%	2055	1.5%
2036	1.5%	2056	1.5%
2037	1.5%	2057	1.5%
2038	1.5%	2058	1.5%
2039	1.5%	2059	1.5%
2040	1.5%	2060	1.5%
2041	1.5%		