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Date:	September 18, 2018
To:	Daniel Bannon, P.E, Baker Design Consultants, Inc.
From:	Nathan Dill, P.E.
Subject:	Machias Flood Resilience Study, Present and Future Flood Risk

Ransom Consulting, Inc. (Ransom) understands the Town of Machias, Maine (Town) is taking a proactive approach to mitigating coastal flood risks as they seek to revitalize the historic waterfront area in downtown Machias. As part of this effort the Town has obtained a grant through the Maine Coastal Communities Program to assist in a planning study that will identify conceptual design plans for flood protection structures along the downtown waterfront, assess the feasibility of such flood protection, perform an economic analysis of the protection afforded by proposed flood protection, and incorporate structural flood protection measures into existing downtown revitalization planning. The Town has engaged Baker Design Consultants, Inc. (Baker) to identify conceptual designs and establish a plan to build flood protection along the existing seawall in downtown Machias. In turn, Baker has engaged Ransom to identify and synthesize existing available information on the present and future flood hazard to aid in seawall design efforts. This memorandum describes our effort to identify appropriate flood hazard information and provides a synthesis of flood hazard information with future sea level rise projections that will be helpful for flood protection design and flood risk assessment.

An assessment of flood risk requires an understanding of two components that make up the risk. First it is necessary to understand the flood hazard, which can be characterized by estimated site-specific flood elevations and the likelihood that a given flood may occur. The second component is an assessment of the possible damages or cost that would be incurred if/when a flood occurs. When this information is known across the entire range of possible flood conditions it can be aggregated to estimate the total risk in terms of an expected cost of damages, which in turn can be used to support planning efforts and cost-benefit analyses for proposed projects that would mitigate risks. This memorandum provides flood hazard information suitable for such an analysis. Possible damage assessment information and subsequent risk analyses are expected to be performed by others.

PRESENT DAY COASTAL FLOOD HAZARD DATA

Ransom has gathered and reviewed sources of available information regarding coastal flood risk in Machias. These include Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS), GROWashington-Aroostook Storm Surge Scenarios, and information from the U.S. Army Corps of Engineers (USACE) North Atlantic Coast Comprehensive Study (NACCS). From this review it was determined that information from the NACCS was most suitable because it provides coastal flood hazard probability information over a range of possible flood conditions, considering exposure to storm surge from possible tropical storm events (e.g. hurricanes) as well as extra-tropical cyclone events (e.g. northeasters). FEMA's information was determined to be less suitable because it only considers flooding from a single extra-tropical event that represents only the single hazard level that has a 1% annual chance of occurrence. The GROWashingtion-Aroostook information does provides flood levels for a range of tropical storm scenarios, which is beneficial for evaluating flooding vulnerability. However, it does not identify the likelihood associated with flooding, and therefore is of limited use in risk analysis.

The North Atlantic Coast Comprehensive Study

Following the wide-spread destruction caused by Hurricane Sandy in October 2012, Congress appropriated funding for the USACE to conduct an extensive study of the impacts of Hurricane Sandy, as well as a comprehensive study of coastal flood hazards from Maine to Virginia. The primary objective of the NACCS was to address the flood risks of vulnerable coastal populations throughout the North Atlantic Coastal Region. Although the impacts of Hurricane Sandy were minimal in Maine, Maine was included in the study so that state interests and local communities would have a consistent approach to identify local flood risk throughout the entire North Atlantic region.

The NACCS used state-of-the-practice statistical methods to determine the magnitude and likelihood of the coastal flood hazard associated with coastal storms, including tropical cyclones (e.g. hurricanes) and extra-tropical cyclones (e.g. nor'easters). These statistical methods, known as the Joint Probability with Optimal Sampling (JPM-OS) method for tropical storms, and the Composite Storm Set (CSS) method for extra-tropical storms, represent the culmination of advances in coastal storm climatology, after more than a decade of effort from the USACE, FEMA, and others, to modernize coastal flood hazard assessments for Atlantic and Gulf of Mexico coasts of the United States.

The NACCS also used leading edge advancements in high-fidelity numerical modeling to simulate the spatially variable physics of the tides, storm surge, and wave responses from extreme coastal storms. The NACCS employed the USACE's Coastal Storm Modeling System (CSTORM-MS), which couples together a sequence of numerical models including the Planetary Boundary Layer model (PBL) to simulate wind and barometric pressure fields, the WAM wave model to simulate deep ocean wave generation and propagation, and the ADvanced CIRCulation hydrodynamic model tightly coupled with the Steady-state WAVE spectral model (ADCIRC+STWAVE) to simulate the combined physics of tides, storm surge, wave transformation, and wave setup. CSTORM-MS was used to simulate the coastal ocean's response to 1,050 synthetic tropical cyclones and 100 historic extra-tropical cyclones utilizing High Performance Computing (HPC) on the massive supercomputers housed at the USACE's Engineer Research Development Center (ERDC) in Vicksburg, Mississippi. The storms were

simulated with and without the dynamic interaction of tides to estimate the non-linear interactions between tides and storm surge; and the storms were also simulated for a scenario with 1 meter of sea level rise to quantify non-linear effects that may occur with sea level rise.

Basic Hazard Statistics

When we discuss flood hazards within a probabilistic framework, we often talk about the likelihood of experiencing a flood of a given magnitude in terms of the Annual Exceedance Probability (AEP). The AEP expresses the probability that the water will exceed a given elevation within any given year. For example, an event with an AEP of 10% has a 1 out of 10 chance of happening within a given year.

Another common way of expressing the likelihood of a hazard is the Average Recurrence Interval (ARI), which is also commonly called the "Return Period". For example, FEMA flood maps are commonly understood to illustrate the extent and elevation of the "100-year flood". The ARI expresses how often, on average, the hazardous conditions is expected to occur given a sufficiently long period of time. For example, an event with an ARI of 10 years would be expected to happen once every ten years on average, which is approximately equivalent to an AEP of 10%.

It is important to understand that an ARI of 10-years does not mean that the event will reoccur precisely every 10 years, but rather, in the long run it will reoccur about every 10 years on average. For example, a 10-year event would be expected to occur about 10 times every 100 years, but within a century you may have multiple decades without a 10-year event and other decades that have multiple 10-year events. The concept of the ARI becomes more challenging and conceptually limited when we consider that sea level rise tends to increase the likelihood of flooding in the future (e.g. the 10-year event of today is not the same as the 10-year event of tomorrow). For this reason, it is helpful to think about the coastal flood hazard in terms of an AEP that changes year to year with changes in the sea level, even when the hazard is commonly expressed in terms of ARI.

For coastal flooding we are concerned with the peak water level that may occur during a coastal storm resulting from a combination of high tide, storm surge, and wave processes. This water level is known as the Total Water level (TWL). Assets that are at elevations lower than the TWL are generally at risk of flooding. The NACCS provides estimates of TWL for a range of flood magnitudes that could occur from either a tropical cyclone event or an extra-tropical event. Figure 1 shows the TWL hazard curve for the NACCS save point nearest to Machias. The curves shown in Figure 1 express the likelihood the TWL would exceed a given elevation in terms of the ARI. Because it is located close to the downtown Machias waterfront, the data from this NACCS save point are appropriate to characterize the coastal flood hazard in Machias.

Table 1 shows TWL hazard data in tabular form, it also lists the AEP that is equivalent to the ARI values. For events rarer than the 10-year event, the AEP is practically equal to the reciprocal of the ARI expressed as a percentage (i.e. AEP=100*1/ARI), while more frequent events have AEP that is less than that. This makes sense if you consider that an event which occurs on average once a year, may happen twice or more in some years and not at all in others.

The NACCS also provides estimates of the uncertainty in the hazard curve. These are shown in Figure 1 and listed in Table 1. Uncertainty arises in the hazard curve estimates due to imperfect knowledge about climatic conditions, model error, observed data limitations, and limitations of

the statistical methods employed. NACCS has provided these uncertainty estimates in terms of upper confidence limits on the hazard curve to aid in certain design procedures that require such confidence limits. Alternatively, the uncertainty can be incorporated into the hazard curves by assuming a specific distribution for possible errors. When considered this way, uncertainty increases the hazard somewhat to account for limited accuracy of the precise flood levels. Incorporation of the uncertainty into the hazard curves is performed using the Monte Carlo techniques described later in this memo. For our purposes we take the upper 68% percent confidence limit to represent the standard deviation of the uncertainty and assume that error is normally distributed.

The information presented in Figure 1 and Table 1 provide representation of the present-day hazard. This information may be useful for risk assessments that do not need to consider increasing risk due to sea level rise. It also forms the basis for the future flood hazard analyses that incorporates sea level rise projections and are described later in this memorandum.

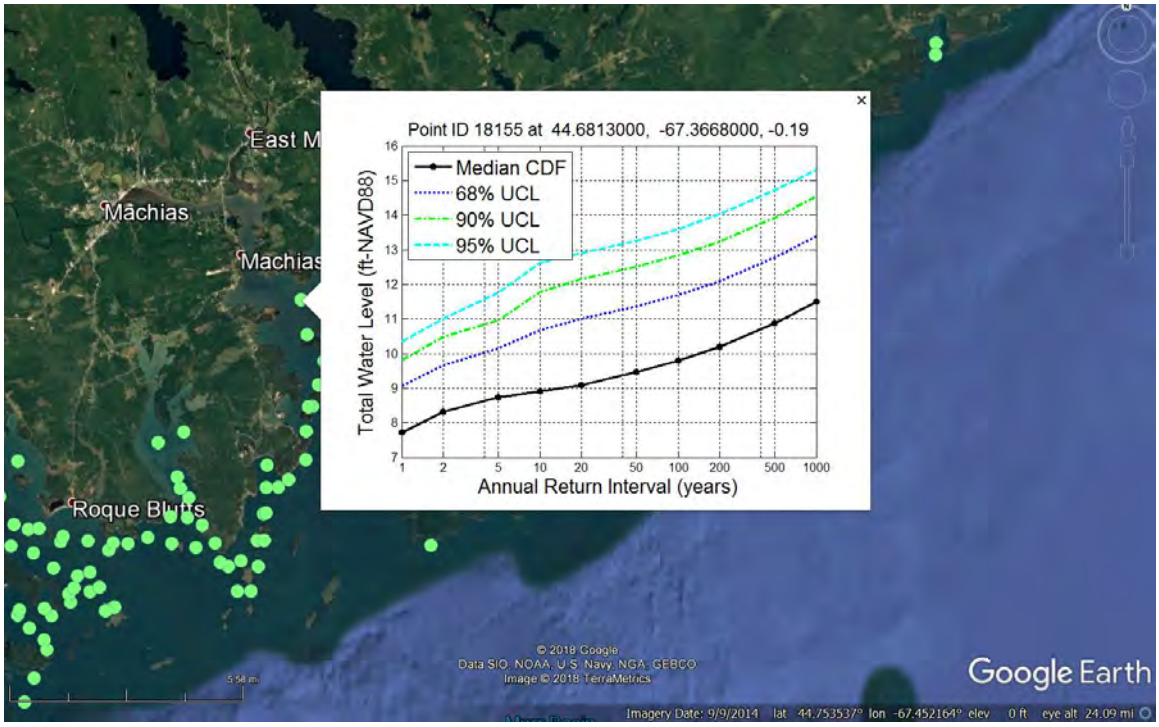


Figure 1. NACCS save points and nearest flood hazard information for Machias.

Table 1. Total Water Level Average Recurrence Interval, Equivalent Annual Exceedance Probability, and 68% Upper Confidence Level for Machias.

Average Recurrence Interval	Annual Exceedance Probability	Median Total Water Level (Ft-NAVD88)	Std. Deviation of Uncertainty (ft)
1-year	63%	7.7	1.35
2-year	39%	8.3	1.35
5-year	18%	8.7	1.41
10-year	9.5%	8.9	1.77
20-year	4.9%	9.1	1.90
50-year	2.0%	9.5	1.90
100-year	1.0%	9.8	1.90
200-year	0.5%	10.2	1.90
500-year	0.2%	10.9	1.90
1000-year	0.1%	11.5	1.90

SEA LEVEL RISE SCENARIO BASED GUIDANCE

Much of the current guidance for sea level rise planning recommends evaluating discrete sea level rise scenarios that cover a range of possible futures in order to encourage decision makers to consider multiple future conditions and identify robust solutions that will be functional in a highly uncertain future[1,2]. Figure 2 shows a set of sea level rise scenarios for Eastport, Maine based on recommendations from the USACE and NOAA and obtained from the USACE's online Sea-Level Change Curve Calculator[3]. The sea level rise scenarios are also tabulated in Table 2. This is the closest location where local sea level rise curves are available from the Sea-Level Change Curve Calculator and should be reasonable for Machias. Following this guidance, Machias should consider the possibility that, by 2050 mean sea level could rise as little as 0.38 feet to as much as 2.10 feet higher than it was in 1992; and that by 2100 sea level could be anywhere from 0.71 feet to 6.67 feet higher than it was in 1992.

[1] Parris, A., P. Bromirski, V. Burkett, D. Cayan, M. Culver, J. Hall, R. Horton, K, Knuuti, R. Moss, J. Obeysekera, A. Sallenger, J. Weiss, 2012. Global Sea Level Rise Scenarios for the United States National Climate Assessment. National Oceanic and Atmospheric Administration Technical Report OAR CPO-1, Climate Program Office (Silver Spring, MD.

[2] USACE, 2014. Global Changes Procedures to Evaluate Sea Level Change Impacts, Responses, and Adaptation, Engineer Technical Letter No. 1100-2-1. Department of the Army, U.S. Army Corps of Engineers Washington, DC

[3] http://www.corpsclimate.us/ccaceslcurves.cfm

Curves like those presented in Figure 2 may intuitively suggest that sea level will follow a particular scenario into the future, but that is actually very unlikely. The scenarios should not be thought of as individual predictions of future sea level, but rather as limits that bound the range of possible future sea levels. This caveat is explained in the federal guidance, but many stakeholders may not be familiar with this detail, resulting in a tendency to focus on a particular scenario in the decision-making process rather than considering a full set of scenarios as recommended.

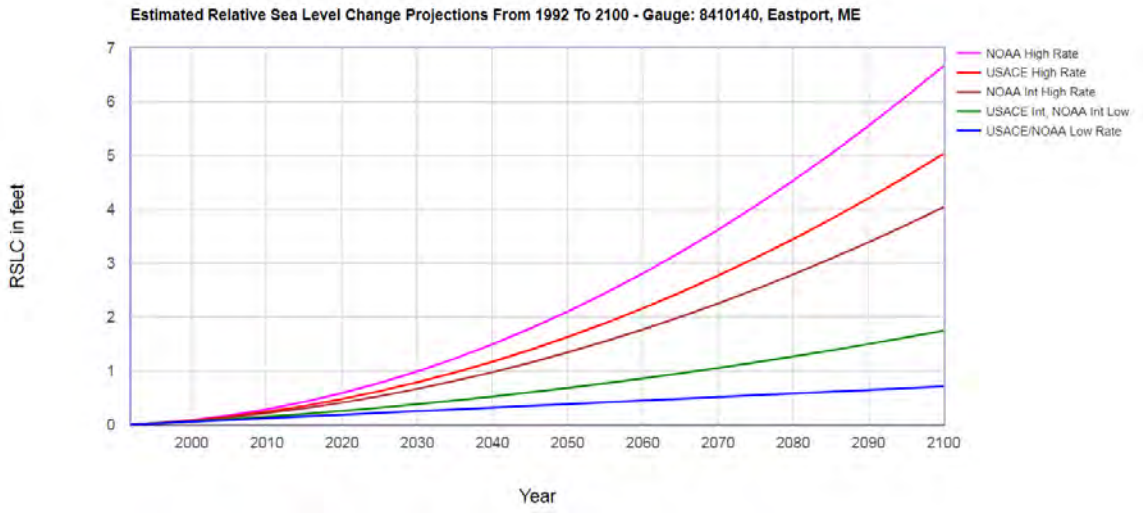


Figure 2. USACE/NOAA Local Sea Level Rise Scenarios for Bar Harbor, Maine

We know from observations that the mean sea level does not follow a smooth curve. In fact, it can vary quite a bit from day to day, month to month, and year to year. The shorter the time scale, the greater the variance. To put this in perspective, Figure 3 adds the observed mean sea level from the historic record at Cutler, Maine to the sea level change scenario curves from Figure 2 showing the transition from what we know about mean sea level to what is projected. The observed mean sea level has been calculated at a range of time scales including the annual mean shown in yellow, the monthly mean shown in cyan, and the daily mean shown in black. The vertical datum for the mean sea levels is the mean level determined by averaging all hourly records during the National Tidal Datum Epoch[4] (NTDE) of 1983-2001. When observations and projections are compared side by side, it becomes apparent that projected sea level rise scenarios ignore the real observed variability in the local mean sea level. Figure 4 shows the same data as Figure 3 but with focus on the present decade, where there is some overlap in the observed data and the sea level change scenarios that are projected from 1992. In Figure 4 we can see the projected scenarios do not even bracket the range of observations. For example, the annual mean

[4] The NTDE is a specific 19-year period over which tide observations are averaged to determine tidal datums, such as Local Mean Sea Level (LMSL), Mean Higher High Water (MHHW), Mean Lower Low Water (MLLW) etc. The NOAA National Ocean Service (NOS) considers a revised NDTE every 20-25 years in order to take into account long-term relative sea level changes caused by global sea level change, and the effects of land movement due to subsidence and/or glacial rebound. When the NDTE is updated, older data which refer to the past NDTE are adjusted to the new NDTE.

sea level (yellow line) was actually higher than the NOAA High Rate in 2010, and then decreased over the following 5 years to a value lower than the Low Rate. The variability in the monthly mean is greater than the full range of scenario guidance out to about 2030, and the variability in the daily mean is greater than full range of scenarios out to about 2050. For this reason, the sea level change scenarios are not really indicative of the possible change in mean sea level that we should expect in the next few decades.

Table 2. USACE/NOAA Local Sea Level Rise Scenarios for Eastport, Maine (feet)

Year	USACE/NOAA Low	USACE Low NOAA Int. Low	NOAA Int. High	USACE High	NOAA High
1992	0.00	0.00	0.00	0.00	0.00
1995	0.02	0.02	0.02	0.02	0.02
2000	0.05	0.06	0.07	0.08	0.09
2005	0.09	0.10	0.13	0.15	0.17
2010	0.12	0.15	0.21	0.24	0.28
2015	0.15	0.20	0.30	0.35	0.42
2020	0.18	0.25	0.41	0.47	0.58
2025	0.22	0.31	0.53	0.62	0.77
2030	0.25	0.38	0.66	0.79	0.99
2035	0.28	0.45	0.81	0.97	1.23
2040	0.32	0.52	0.97	1.17	1.49
2045	0.35	0.60	1.15	1.39	1.78
2050	0.38	0.68	1.34	1.63	2.10
2055	0.41	0.77	1.55	1.89	2.44
2060	0.45	0.86	1.77	2.16	2.81
2065	0.48	0.95	2.00	2.46	3.20
2070	0.51	1.05	2.25	2.77	3.62
2075	0.55	1.16	2.51	3.10	4.06
2080	0.58	1.27	2.79	3.45	4.53
2085	0.61	1.38	3.08	3.82	5.03
2090	0.64	1.50	3.39	4.20	5.55
2095	0.68	1.62	3.71	4.61	6.10
2100	0.71	1.75	4.04	5.03	6.67

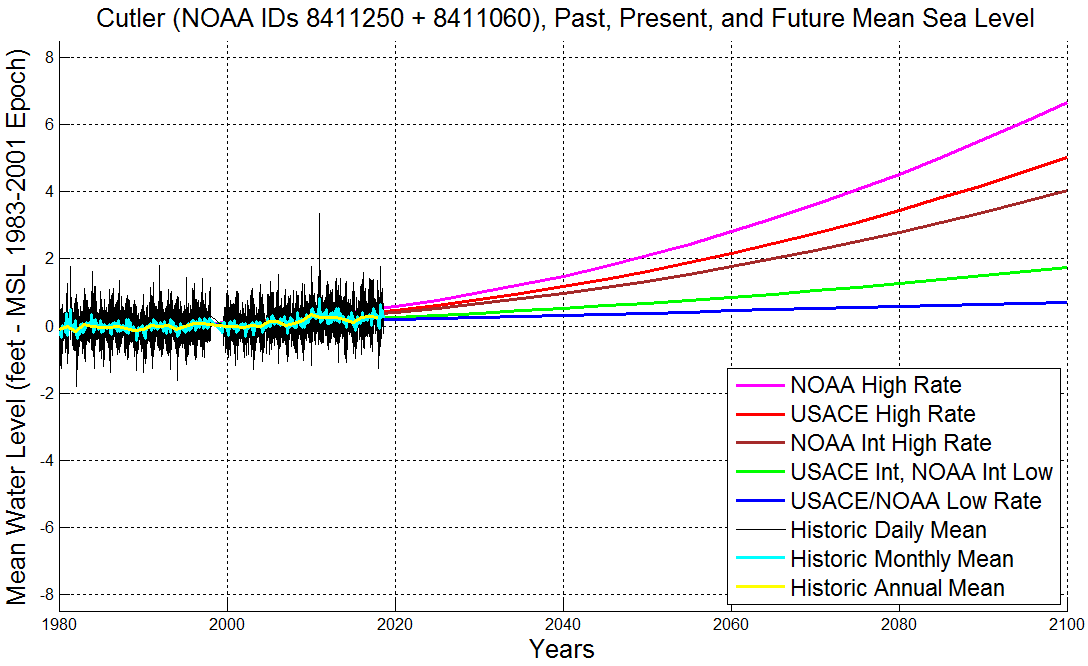


Figure 3. USACE/NOAA Local Sea Level Rise Scenarios and Historic Mean Sea Level for Cutler, Maine – 1980 to 2100

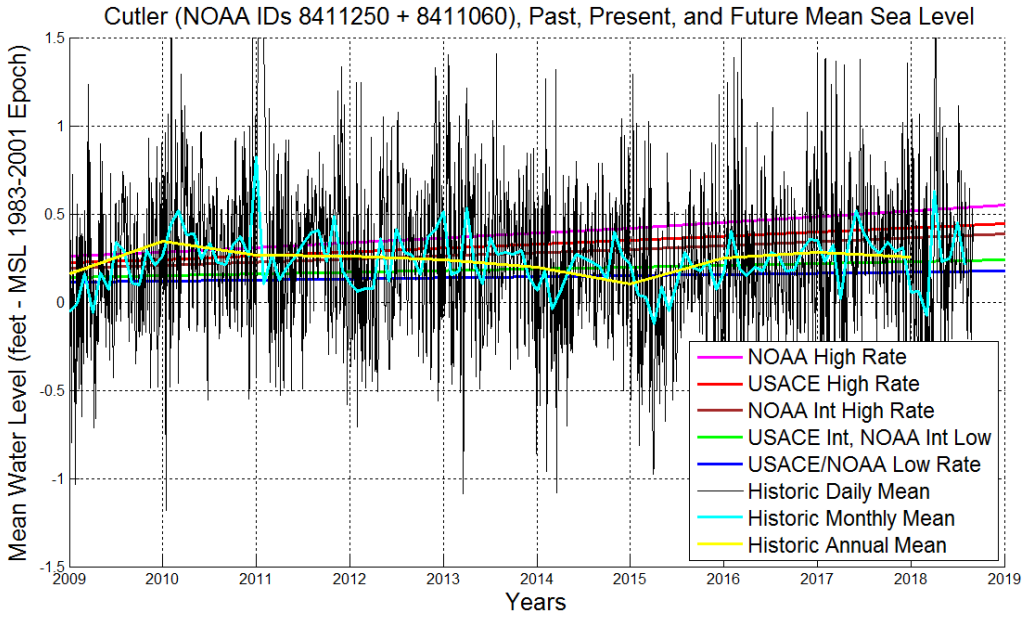


Figure 4. USACE/NOAA Local Sea Level Rise Scenarios and Historic Mean Sea Level for Cutler, Maine - 2010 to 2019

PROBABILISTIC SEA LEVEL CHANGE

The scenario based approach to sea level change suffers from two inter-related problems. The first, mentioned in the previous section, is that it inadvertently inspires focus on individual scenarios, which are subject to prejudices of decision makers. The second problem is that it provides no information about how likely the various scenarios may be. So even when decision makers correctly consider a range of scenarios, they are at a loss when it comes to weighing the different scenarios against one another. They may inadvertently place too much weight on an unlikely outcome and/or too little weight on the more likely outcomes.

These problems can be alleviated by considering the mean sea level as a non-stationary random process. A random (or stochastic) process describes a variable that evolves through time in a non-deterministic way. This means that, even though values of the variable that are close in time may be close to one another, there is no way to precisely determine a future value based on the history of past values. Instead, a future value is characterized by a probability distribution that expresses how likely it is within a range of possible values. In other words, we can expect the mean sea level for next year to be close to the mean sea level this year, but history cannot tell us if it will go up or down, or precisely how much it will change. History only tells us how likely the change will be within a range of possible values. A random process is considered non-stationary if the parameters that describe its probability distribution (e.g. mean and variance) change with time. In the case of sea level, current climate science tells us that the mean is expected to change, and the variance will increase in the future because more distant projections are less certain. When we consider that the future mean sea level is a non-stationary random process we are able to apply a statistical model to offer guidance on the likelihood of future scenarios. With this type of probabilistic information we are able to apply Risk Informed Decision Making (RIDM) to planning for sea level rise adaptation, and mitigation of future coastal flood risk. This approach is also conceptually appealing because it does not preclude the possibility that sea level may actually decrease at times in the future; a circumstance that is clearly possible given observations presented in Figure 4 and sometimes used by climate change skeptics to discount scenario based guidance that increases sea levels into the future without any limits.

Probabilistic sea level change guidance should not be thought of as a replacement for the scenario based guidance recommended by NOAA and the USACE. Instead it should be considered as a supplement to scenario based guidance that quantifies the likelihood of individual scenarios and allows application of RIDM. Probabilistic guidance for sea level change is not a new idea. For example, the U.S. Environmental Protection Agency (USEPA) saw the need for probability-based guidance on sea level rise over 20 years ago, and provided probability-based projections of global sea level rise for planning use[5]. Paris et al (2012)[1] mention probabilistic projections as another form of scenario guidance, but they do not pursue it, citing no accepted widely available method for producing probabilistic guidance at regional or local scales. The USACE also mentions probabilistic guidance, but then echo the same lack of accepted methods and large degree of uncertainty cited by NOAA.

[5] Titus, J.G., V. K. Narayanan. 1995. The Probability of Sea Level Rise. United States Environmental Protection Agency, Office of Policy, Planning, and Evaluation, EPA 230-R-95-008, September 1995.

More recently, Kopp et al. (2014)[6] provide localized actionable probabilistic information. For our study, we adopt their data to characterize probabilistic future sea level change at Cutler. Their data provide cumulative probability distributions for local mean sea level at years 2030, 2050, 2100, and 2150 for three of the Representative Concentration Pathways (RCP) adopted by the Intergovernmental Panel on Climate Change (IPCC) in their fifth assessment report[7]; these are shown in Figure 5 thru Figure 8, respectively. The cumulative probability distributions show the probability that the future sea level will be less than the corresponding sea level rise value. For example, in Figure 5, for RCP 2.6, we see that there is a 60% probability that sea level rise by 2030 will be less than 20 centimeters (0.7 feet), or complementarily a 40% probability that local mean sea level will rise more than 20 centimeters (0.7 feet) before 2030. Using this information, we can evaluate the probability that future sea levels will be greater or less than the USACE and NOAA scenarios. Table 3 lists the probability sea level will be greater than the USACE and NOAA sea level rise scenarios at 2030, 2050, and 2100 based on the probabilistic guidance.

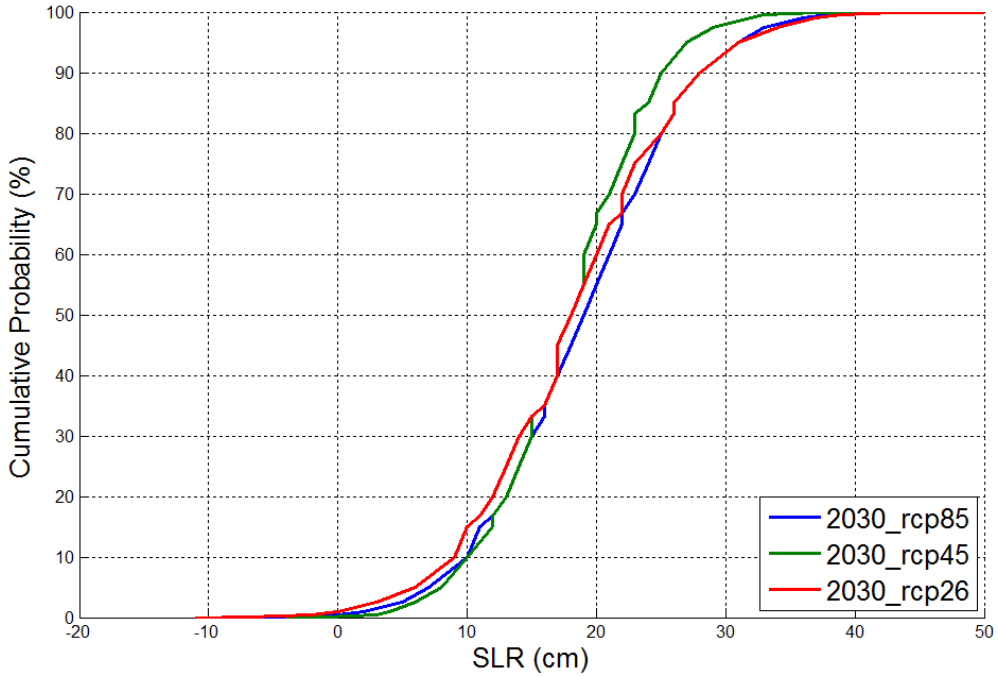


Figure 5. Sea Level Rise Cumulative Probability Distributions for 2030, Cutler, ME

[6] Kopp, R. E., R. M. Horton, C. M. Little, J. X. Mitrovica, M. Oppenheimer, D. J. Rasmussen, B. H. Strauss, and C. Tebaldi (2014), Probabilistic 21st and 22nd century sea-level projections at a global network of tide-gauge sites, *Earth's Future*, *2*, 383–406, doi:10.1002/2014EF000239.

[7] Intergovernmental Panel on Climate Change (2013), Summary for policy makers, in *Climate Change 2013: The Physical Science Basis*, edited by T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P. Midgley, pp. 3–29, Cambridge Univ. Press, Cambridge, U. K.

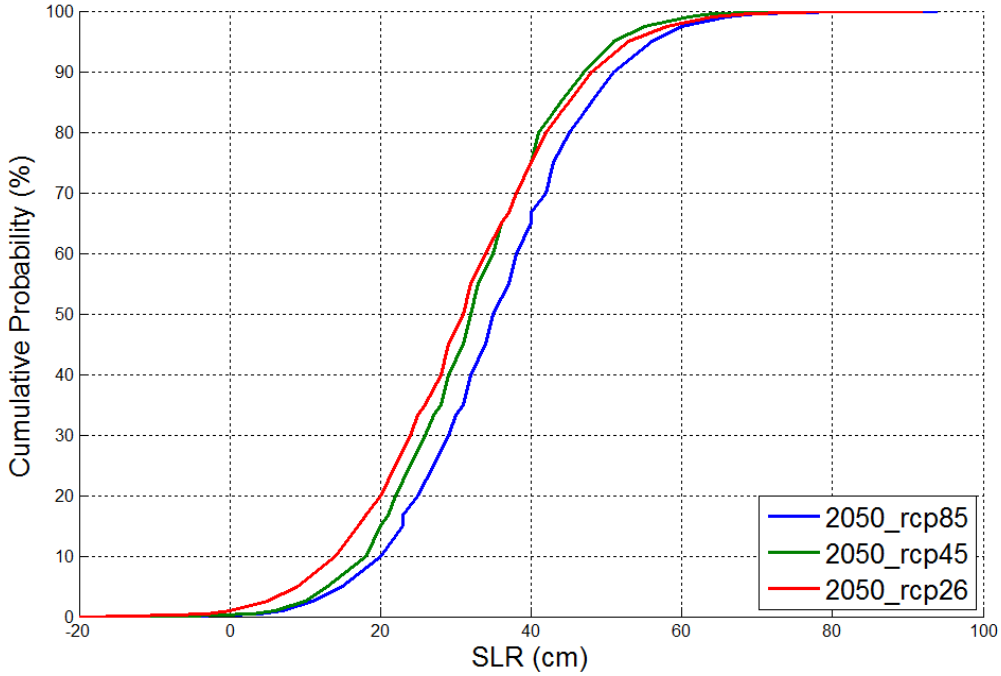


Figure 6. Sea Level Rise Cumulative Probability Distributions for 2050, Cutler, ME

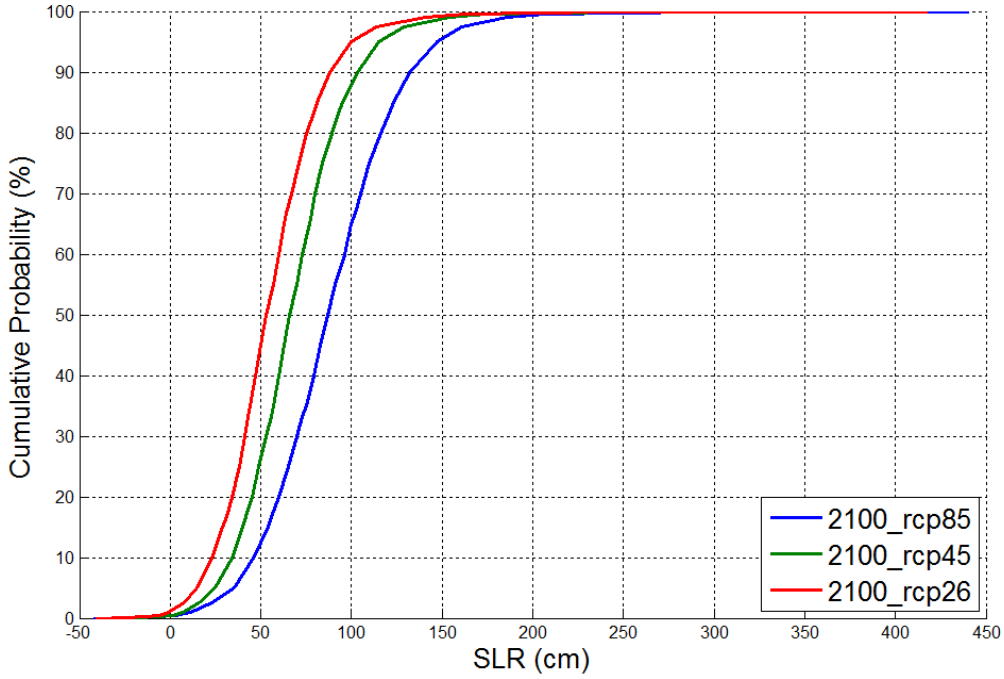


Figure 7. Sea Level Rise Cumulative Probability Distributions for 2100, Cutler, ME

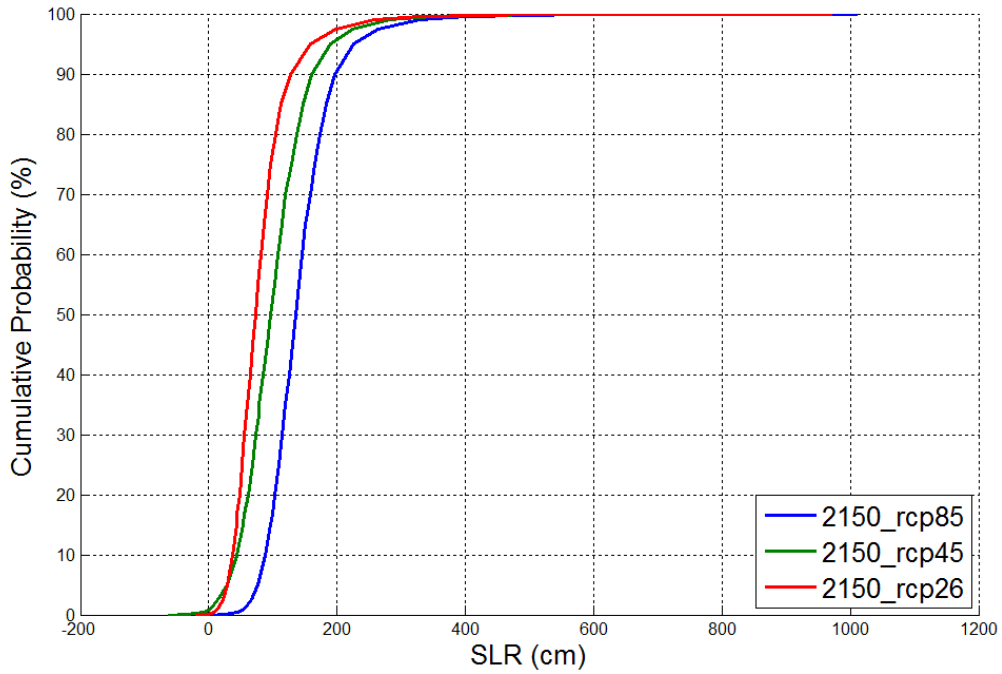


Figure 8. Sea Level Rise Cumulative Probability Distributions for 2150, Cutler, ME

Table 3. Probability Sea Level Rise will exceed the USACE/NOAA Scenarios

Year	Low Rate	USACE Low NOAA Int. Low	NOAA Int. High	USACE High	NOAA High
2030	96%	79%	61%	16%	6%
2050	99%	91%	75%	17%	4%
2100	100%	99%	95%	28%	4%

We can visualize the future sea level probability with greater detail by generating a large number of possible future sea levels and plotting the probability density (i.e. the relative probability that mean sea level will fall within a given time and height range. Samples of future sea levels can be generated randomly following the technique illustrated in Figure 9. This technique uses the sea level rise cumulative probability distribution curves to find a set of future sea levels that are consistent with the probabilistic guidance. Uniform values of probability (green squares) are used to find corresponding sea level rise values (red squares). In practice, we use a random number generating algorithm that applies this technique to generate a large set of possible future sea levels. A new set of possible sea levels is generated for each year by linearly interpolating between the curves given by Kopp et al. (2014), while the three RCP scenarios are each given equal weight. Then the set of random possible sea levels is sorted into elevation bins, and the number of samples within each bin is counted to estimate the probability that sea level will fall within that bin in that future year.

Figure 10 shows the future sea level probability density overlaid by the NOAA and USACE sea level change scenario curves. Inspection of Figure 10 and the data in Table 3 suggest that for the near future (to about 2050) sea level chance will most likely coincide with the intermediate to high scenarios, and that it is reasonably possible that sea level will rise more than the highest scenario. However, as we get toward the end of the 21st century the higher scenarios become much less likely and the range of possible future sea levels spreads out significantly.

It may be tempting to use this probabilistic guidance to identify a most probable scenario for planning purposes; for example, by projecting a scenario that follows the maximum probability density. However, the identification and use of a most probable scenario is ill-advised because, given large degree of uncertainty in future projections, even the most probable scenario is very unlikely. Instead of using the probabilistic guidance to identify a most probable scenario, we recommend an approach to coastal hazard analysis that considers the full range of possible future sea level scenarios that is informed by the probabilistic information so that the results can be applied within a RIDM framework. This may be accomplished through the Monte Carlo analysis methods that combine the probabilistic sea level change information with probabilistic flood hazard information.

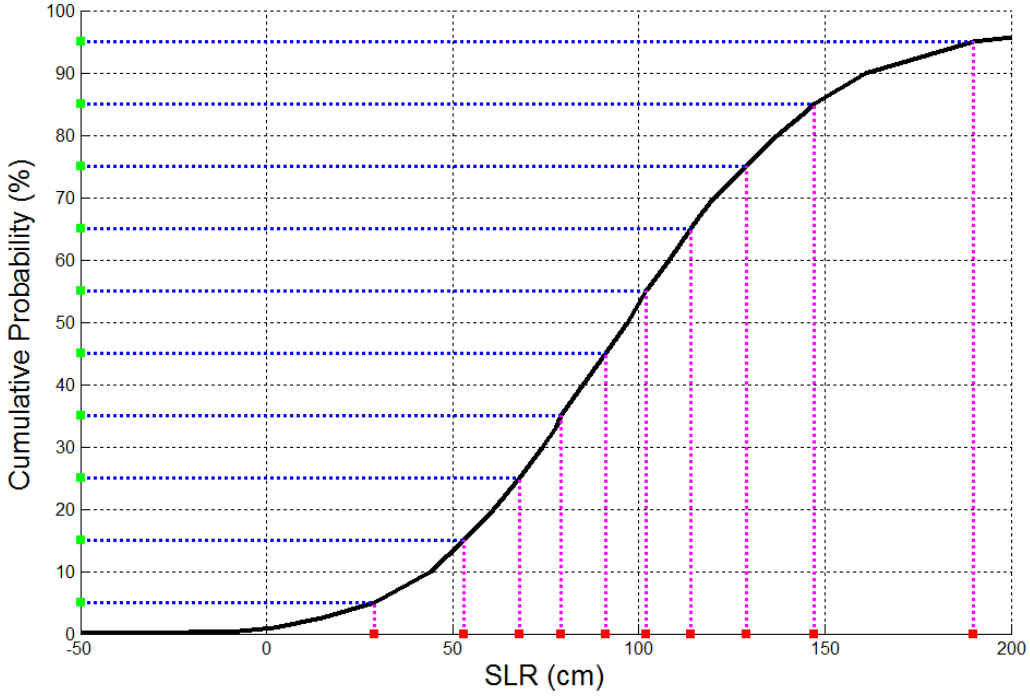


Figure 9. Random Sampling from a Sea Level Rise Cumulative Probability Distribution

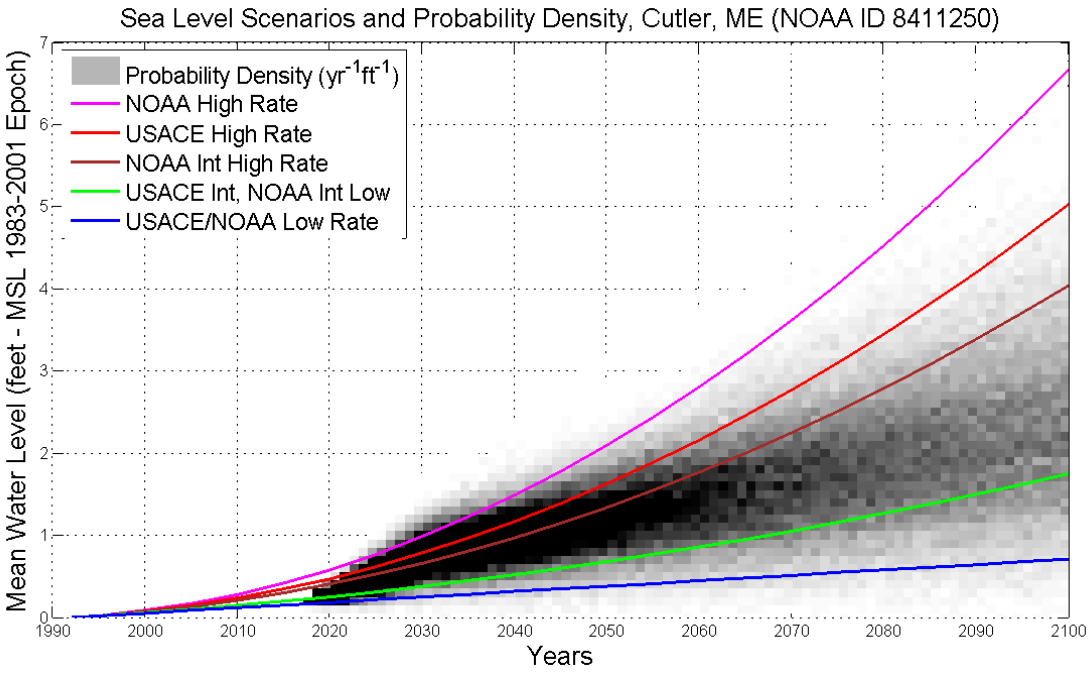


Figure 10. Comparison of NOAA/USACE Sea Level Rise Scenarios and Future Sea Level Probability Density, Cutler, Maine

MONTE CARLO SIMULATION - COMBINED SEA LEVEL RISE AND FLOOD HAZARD

Monte Carlo simulation, named after the well-known gambling establishment in Monaco, is a technique that uses randomness to solve numerical problems. In this case, we combine a large number of random samples of flood levels with a large number of random samples of future sea level rise values to generate a large sample of possible future flood levels. We also add an additional term to the simulation to account for uncertainty. To account for uncertainty, we draw random samples from a normal (Gaussian) distribution with a mean and standard deviation specified to approximate the model error. In this case a standard deviation of 1.9 feet is used based on the NACCS 68% percent Upper Confidence Interval.

The Monte Carlo simulation is executed with the following steps to determine the ARI curves for future storm tide water levels. For a future year that we would like to know the coastal storm hazard:

1. Randomly select a maximum storm tide from the storm tide ARI/AEP curve;

2. Randomly select a sea level change value from the sea level rise cumulative probability distribution for the future year. If necessary, find values from a year before the year of interest and a year after the year of interest and linearly interpolate to get the value for the year of interest;

3. Randomly select an error value from the uncertainty cumulative probability distribution curve;

4. Sum the values from steps 1 thru 3 and record one possible future annual maximum storm tide level for the year of interest;

5. Repeat steps 1 thru 4 20,000 times to generate 20,000 possible annual maximum storm tide values for the future year; and

6. Sort the values from step 5 into elevation bins, count the number in each bin and empirically determine the ARI curve for the future flood hazard.

To illustrate the Monte Carlo procedure, and in keeping with the gambling analogy, we have developed the Storm Surge Slot Machine (S3M). S3M is an educational game of chance designed to give the players a sense of the range possibilities and the degree of uncertainty with future coastal flood hazards. S3M can be played with any number of players. The game play is simple, requiring only a pair of dice and a set of playing cards, which are analogous to the cylinders in a slot machine. The playing cards are based on the cumulative probability distributions used in the Monte Carlo analysis and may be developed for a specific site. A ruler and notepad are also recommended to aid in play. Playing instructions and playing cards based on the hazard analysis at Machias are provided in Attachment A**.**

PRESENT AND FUTURE FLOOD HAZARDS

When probabilistic projections of sea level rise are mathematically combined with the flood hazard data through Monte Carlo Simulation, the resulting future hazard curves express the hazard considering all possibilities for sea level rise. In this case it becomes meaningless to discuss any particular sea level rise scenario because the hazard curve probabilistically considers all possible scenarios. In other words, where the results show a flood level associated with a particular ARI for a particular future year (e.g. the 100-year flood level for the year 2070), the level shown represents the future hazard considering all possibilities of sea level rise up to that future year. Because the sea level rise probability information used in this analysis has been developed by experts in the area of climate science and sea level rise processes[8], this approach places the choice of what sea level rise scenarios and how likely each of those scenarios are into the hands of those experts, allowing the community stakeholders to focus on identifying the vulnerabilities within their community and the adaptation measures that may reduce their risk. In contrast, current scenario-based guidance may ask stakeholders to consider very unlikely scenarios in their decision-making process (e.g. a 100-year flood plus the NOAA high projection for 2100) without providing any understanding of how unlikely the scenario may actually be.

RISK ASSESSMENT

The Monte Carlo simulation described above was carried out for each decade between 2020 and 2120. The resulting future flood hazard curves are shown in Figure 11 and tabulated in Table 4. It is noteworthy that future sea level rise is expected to cause the hazard associated with rarer events to increase faster than the hazard associated with more frequent events. For example, the

[8] Kopp, R. E., R. M. Horton, C. M. Little, J. X. Mitrovica, M. Oppenheimer, D. J. Rasmussen, B. H. Strauss, and C. Tebaldi (2014), Probabilistic 21st and 22nd century sea-level projections at a global network of tide-gauge sites, *Earth's Future*, *2*, 383–406, doi:10.1002/2014EF000239.

10-year TWL is expected to increase about 3.4 feet from 2020 to 2120 while the 500-year TWL is expected to increase 6.7 feet feet during the same period. The greater increase in the more extreme hazards reflects the fact that increasing uncertainty in future sea level rise leads to greater risk in the future. This fact may not be apparent with scenario-based sea level rise guidance and is often ignored in planning studies that apply uniform sea level rise values to a present-day hazard curve to estimate future risks. In contrast, the Monte Carlo approach allows us to quantify how much the risk will increase due to increasing uncertainty in the future.

When the elevation of a specific asset is known, this hazard information can be used to evaluate Changes in the flood hazard. For example, Figure 12 presents the probability of flooding in two ways. The blue line on the figure shows the probability that an elevation of 11 feet will be exceeded within each future year. The red line shows the compounded probability that 11 feet will be exceeded at least once prior to the future year. From the annual probability plot (blue line) we can see that there is about a 4% chance the TWL exceeded 11 feet once during 2020, this chance will increase to about 12% by 2050, and be nearly 40 % by 2120. The compounded probability plot (red line) shows us that there is about a 72% chance that the TWL will exceed 11 feet at least once by 2040, and it is nearly certain (greater than 95% chance) that the TWL will exceed 11 feet at least once before 2060.

This information can also be used to assess the risk of particular assets that are exposed to this flood hazard. In addition to the hazard information, a risk assessment requires information that describes the cost of damage associated with the hazard. This may be done using depth-damage functions like the example shown in Figure 13. Better yet, asset specific damage functions may be developed for specific infrastructure. Once the damage associated with a certain depth of flooding is established the hazard information presented here may be used to determine the likelihood of experiencing that damage. The expected cost of damage in a given year can then be determined by multiplying the cost of damage by the probability of flooding at that level. Summing costs over the full range of possible flood levels results in the expected cost of risk for that year. This cost can then be aggregated over a range of future years to determine the lifetime cost associated with flood risk. An example for a $500,000 asset at 11 feet elevation is shown in Figure 14. In this example the present day risk accounts to less than $5000 per year (about 1% of the asset value) however when future risk is considered we see the risk increases dramatically over the next few decades to nearly $10,000 per year by 2060, and more than $25,000 per year by 2100. The aggregate cost over the next century is about $670,000, which is significantly more than present value of the asset. This simplified analysis is just an example of how the cost of future flood risk may be evaluated. It is recommended that asset specific depth damage functions and elevations be used to determine risk for specific assets in downtown Machias. Additional economic factors such as inflation and projected changes in real estate value may also be considered.

RECOMMENDATIONS AND NEXT STEPS

At this time Ransom is not providing any specific recommendations regarding the elevation of proposed flood protection structures for downtown Machias. Instead we recommend that the information in this memorandum be considered along with the economic analyses that are being undertaken as part of this project to weight the costs and benefits of flood protection alternatives. Benefits may include cost savings from reduced flood risk afforded by flood protection alternatives. However, it is important to consider the role of flood insurance in managing flood risk in this case. Specifically, National Flood Insurance Program (NFIP) requirements for flood

protection structures must be met in order to realize the benefit of risk reduction in terms of reduced flood insurance costs. These requirements include designing and building a structure that can be certified to provide protection against the 1% annual chance flood as defined by FEMA, and FEMA flood maps must be revised to reflect this protection. If the structure does not meet this requirement or the flood maps are not adequately revised, property owners may still be required to purchase flood insurance which might negate reduced risk benefits provided by the flood protection structure.

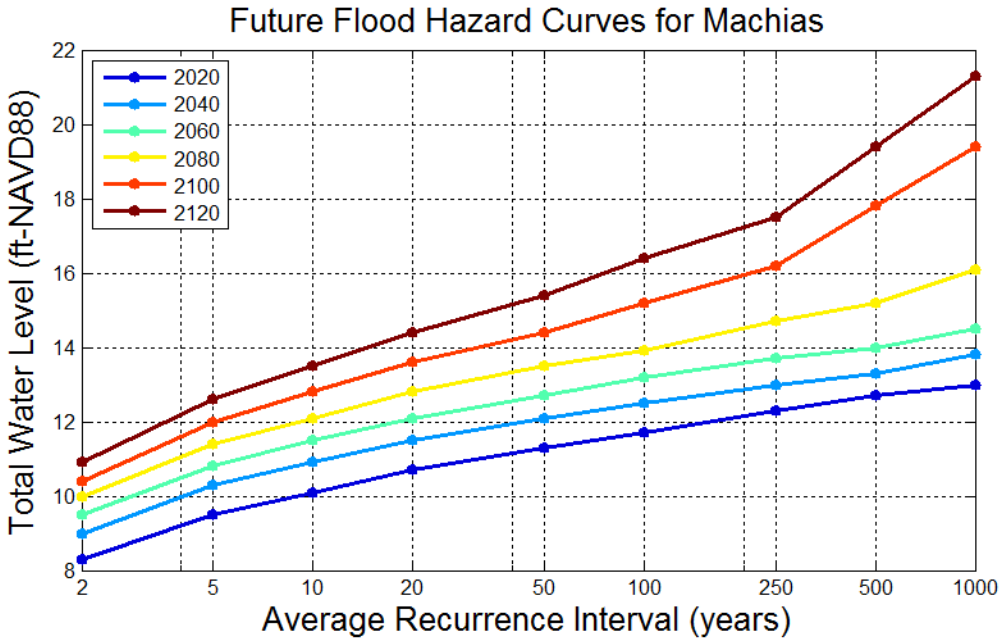


Figure 11. Total Water Level Flood Hazard for Future Sea Levels at Machias.

Table 4. Total Water Level Average Recurrence Interval for Future Years Including Uncertainty and Probabilistic Sea Level Rise Guidance for All Sea Level Rise Scenarios.

TWL in Feet NAVD88		Average Recurrence Interval (years)							
		2	5	10	20	50	100	250	500
Future Year	2020	8.3	9.5	10.1	10.7	11.3	11.7	12.3	12.7
	2030	8.8	10	10.6	11.2	11.7	12.1	12.7	13.1
	2040	9	10.3	10.9	11.5	12.1	12.5	13	13.3
	2050	9.3	10.5	11.2	11.8	12.4	12.9	13.4	13.7
	2060	9.5	10.8	11.5	12.1	12.7	13.2	13.7	14
	2070	9.7	11.1	11.8	12.4	13.1	13.6	14.2	14.8
	2080	10	11.4	12.1	12.8	13.5	13.9	14.7	15.2
	2090	10.2	11.7	12.4	13.1	14	14.5	15.3	16.1
	2100	10.4	12	12.8	13.6	14.4	15.2	16.2	17.8
	2110	10.7	12.3	13.2	14	15	15.9	17.4	18.5
	2120	10.9	12.6	13.5	14.4	15.4	16.4	17.5	19.4

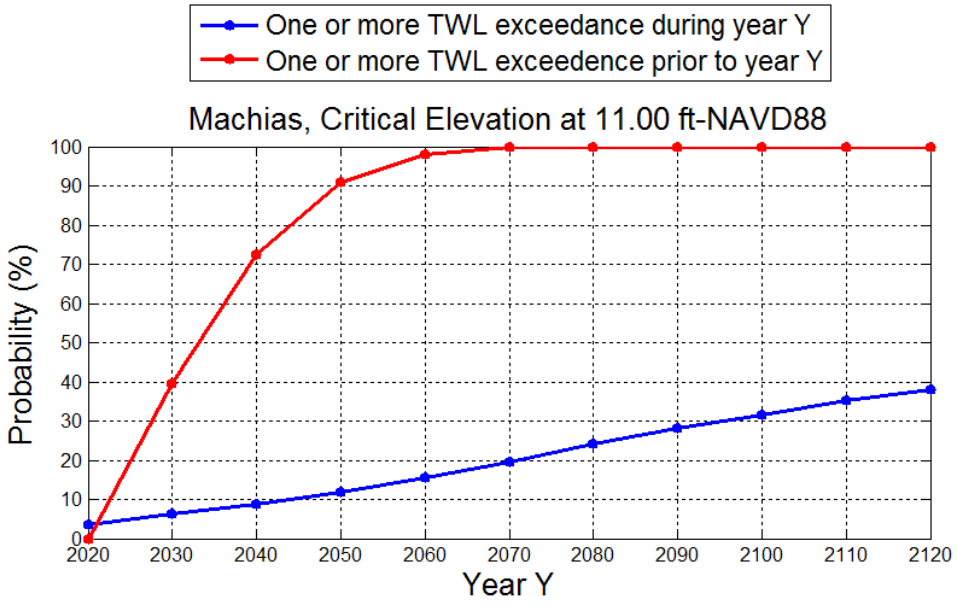


Figure 12. Present and Future Probability of TWL Exceeding 11 feet at Machias Waterfront

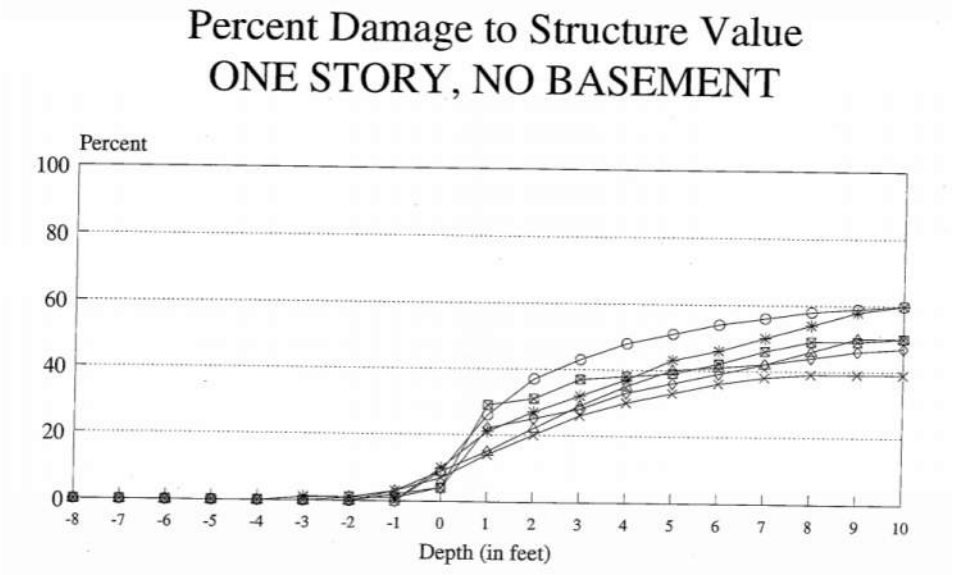


Figure 13. Example Depth Damage Functions[9]

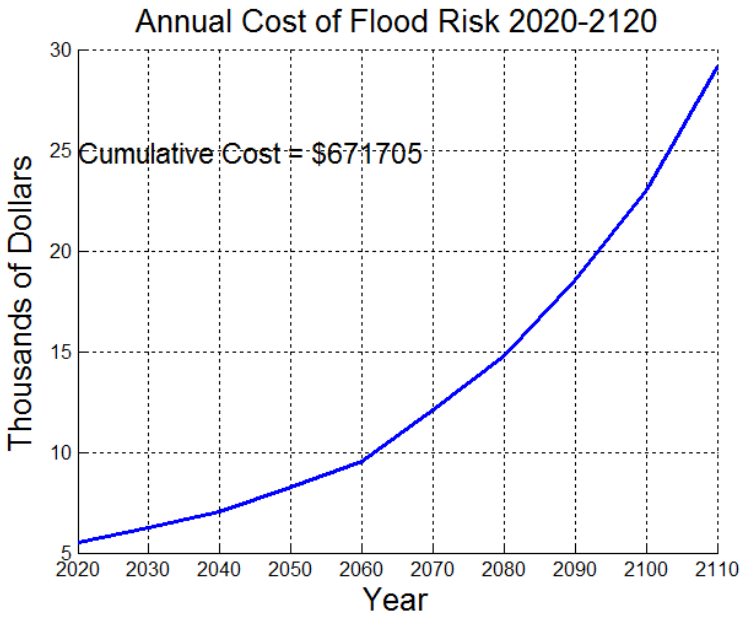


Figure 14. Example Risk Assessment for a $500,000 asset at 11 feet elevation in Downtown Machias considering future flood risk.

[9] USACE, 1992. Catalog of Residential Depth-Damage Functions Used by the Army Corps of Engineers in Flood Damage Estimation. IWR Report 92-R-3, May 1992

Appendix C – Flood Impacts to Machias Downtown Property

a. BUILDING INVENTORY SPREADHEET; Baker Design Consultants; Data Collected in 2018.

b. Flood Hazard Inundation Plans; Baker Design Consultants

   a. Sheet FH-0 Mapped Hazard Areas and Surveyed Topography

   b. Sheet FH-1 Flood Scenario 1- Flooding to Base Flood Elevation (BFE) = 10.7 NAVD88.

   c. Sheet FH-2 Flood Scenario 2- BFE + 2-ft = 12.7 NAVD88.

   d. Sheet FH-3 Flood Scenario 3- BFE + 4-ft = 14.7 NAVD88

   e. Sheet FH-4 Flood Scenario 4- BFE + 6-ft = 16.7 NAVD88

Downtown Building Inventory
1/30/2019

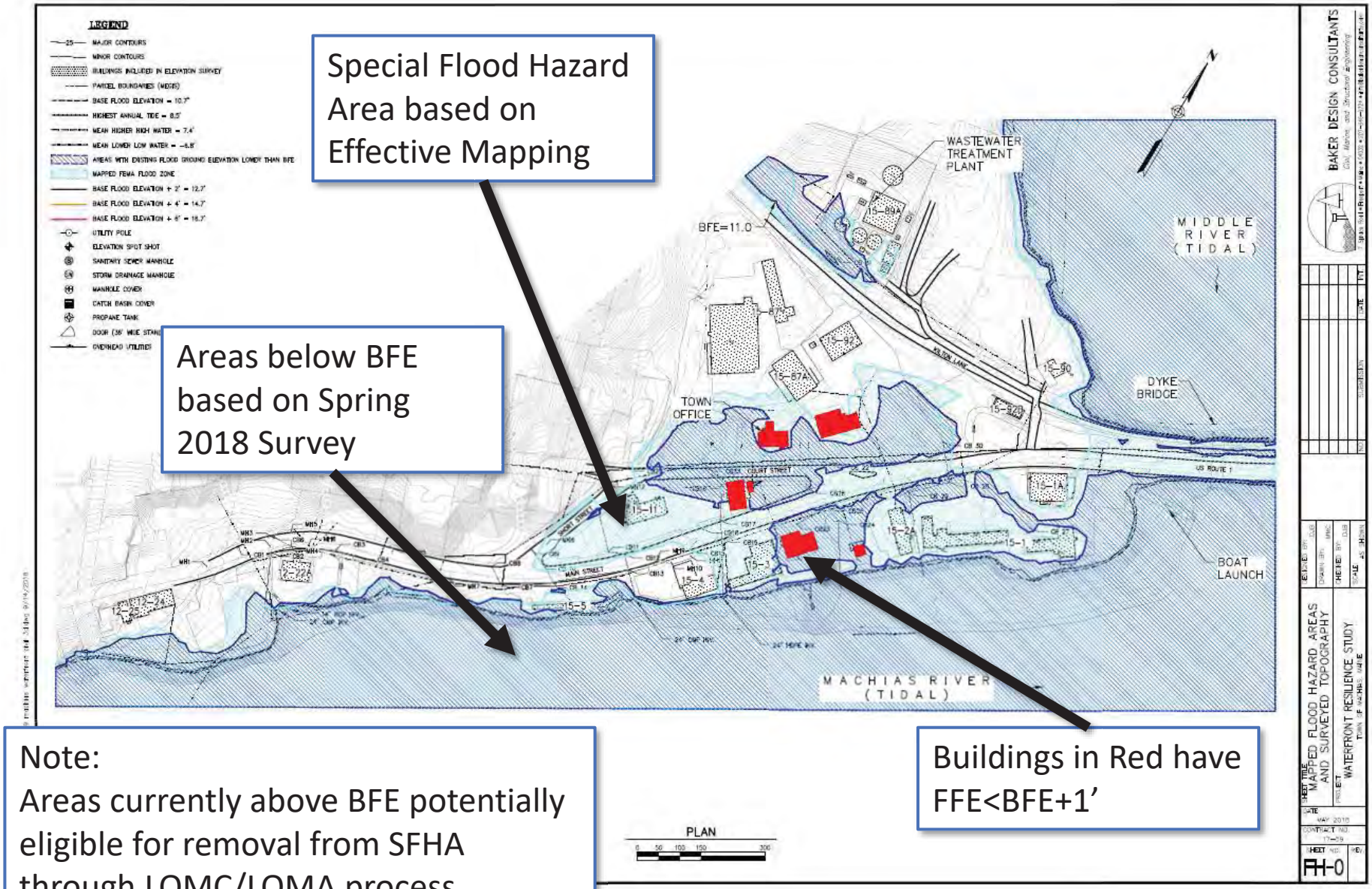
Baker Design Consultants

Map/Lot		Machias Downtown Building Inventory	Property Value	Lowest Floor Elev	HAG	LAG	Within SFHA ?	Freeboard Above BFE			Inundation Scenario (Flooding exceeds level indicated)				Floor At Grade	Base-ment ?	Garage?	Ext Propane Tank Elev
								FFE	HAG	LAG	Scenario 1 BFE	Scenario 2 BFE+2-ft	Scenario 3 BFE+4-ft	Scenario 4 BFE+6-ft				
12	24	Machias Hardware	$ 95,200.00	11.9	18.8	11.8	---	1.2	8.1	1.1	No	Yes	Yes	Yes	Slab	No	No	13.1
12	25	Barber Shop	$ 24,300.00	16.0	22.0	12.1	---	5.3	11.3	1.4	No	No	No	Yes	On Posts	?	No	---
15	1A	Helen's Restaurant	$ 727,200.00	13.3	12.4	11.2	AE 10.7	2.6	1.7	0.5	No	Yes	Yes	Yes	Slab	No	No	Undergrnd
15	2A	Berry Vines	$ 75,800.00	14.0	12.7	10.8	AE 10.7	3.3	2.0	0.1	No	No	Yes	Yes	Slab	No	No	11.5
15	2A	Rivers Edge Drive-In/Shake Pit	$ 75,800.00	11.5	10.5	10.2	AE 10.7	0.8	-0.2	-0.5	Yes	Yes	Yes	Yes	Slab	No	No	10.2
15	11	Bluebird Restaurant	$ 283,600.00	13.3	13.5	11.0	AE 10.7	2.6	2.8	0.3	No	Yes	Yes	Yes	Slab	No	No	12.1
15	91	US Cellular, Subway, Etc.	$ 209,000.00	10.9	11.5	10.6	AE 10.7	0.2	0.8	-0.1	Yes	Yes	Yes	Yes	Slab	No	No	---
15	92	Pellon Center	$ 216,700.00	11.9	11.9	11.6	---	1.2	1.2	0.9	No	Yes	Yes	Yes	Slab	No	No	---
15	92B	Machias Bay Chamber of Commerce	$ 15,000.00	13.0	13.2	12.8	---		2.5	2.1	No	Yes	Yes	Yes	On Posts	No	No	12.8
15	1	Machias River Inn, East	$ 1,171,100.00	12.4	12.4	9.7	AE 10.7	1.7	1.7	-1.0	No	Yes	Yes	Yes	Slab	No	No	11.9
15	1	Machias River Inn, West		13.6	13.7	11.4	AE 10.7	2.9	3.0	0.7	No	No	Yes	Yes	Slab	No	No	12.4
15	2	Living Innovations	$ 166,800.00	10.1	10.8	9.8	AE 10.7	-0.6	0.1	-0.9	Yes	Yes	Yes	Yes	Slab	No	No	10.3
12	22A	Bar Harbor Bank & Trust	$ 209,700.00	14.08	13.97	13.4	---	3.38	3.27	2.7	No	No	Yes	Yes	Slab	No	No	---
15	3	Wall's Appliance	$ 135,700.00	11.7	11.7	10.8	AE 10.7	1.0	1.0	0.1	Yes	Yes	Yes	Yes	Slab	No	Yes	---
15	4	Irving*	$ 530,000.00	13.7	14.1	12.0	---	3.0	3.4	1.3	No	No	Yes	Yes	Slab	No	No	11.9
15	13	Skywalker's Bar & Grille	$ 143,000.00	11.0	11.0	9.6	AE 10.7	0.3	0.3	-1.1	Yes	Yes	Yes	Yes	Slab	No	No	10.4
15	86	Machias Town Office	$ 134,500.00	11.14	11.23	10.57	AE 10.7	0.44	0.53	-0.13	Yes	Yes	Yes	Yes	Slab	No	No	---
15	87/87A	EBS Building Supplies, Back		12.0	12.5	12.0	---		1.8	1.3	No	No	No	No				---
15	87/87A	EBS Building Supplies, Side	$ 137,900.00	12.1	11.8	10.8	AE 10.7	1.4	1.1	0.1	No	Yes	Yes	Yes				---
15	87/87A	EBS Building Supplies, Main	$ 416,100.00	12.3	12.6	11.4	---	1.6	1.9	0.7	No	Yes	Yes	Yes				---
15	5	Machias River Redemption	$ 43,900.00	13.51	11.99	8.69	AE 10.7	2.81	1.29	-2.01	No	No	Yes	Yes	On Posts	No	Yes	8.58
15	89	Wastewater Treatment Plant	$ 1,024,800.00	16.0	14.0	11.7	AE 11.0	5.0	3.0	0.7	No	No	No	Yes	Slab	No	No	---
15	90	Private Residence	$ 45,000.00	13.4	13.4	12.6	---	2.4	2.7	1.9	No	Yes	Yes	Yes				13.5
15	85	Private Garage 13 Court St	$ 4,500.00	8.1	8.1	8.1				-2.6	Yes	Yes	Yes	Yes				
15	84	Private Abandoned 15 Court	$ 14,000.00	10.1		9.1				-1.6	Yes	Yes	Yes	Yes				
Notes:			$ 5,899,600.00			Total	14				8	17	21	23				

1 All elevations are to NAVD88 Vertical Datum
2 LAG - Lowest adjacent finished grade next to building; HAG - Highest adjacent finished grade adjacent to building
3 Properties identified as "Mapped within SFHA" based on 2017 FEMA FIRMs for Machias, ME
4 Based on Town of Machias Floodplain Management Ordinance, minimum FFE elevation is 1' above BFE for buildings in AE Zone
*US Army Corps of Engineers (Table 43) (http://www.mvn.usace.army.mil/Portals/56/docs/PD/Donaldsv-Gulf.pdf)

Yes Below Floor damage

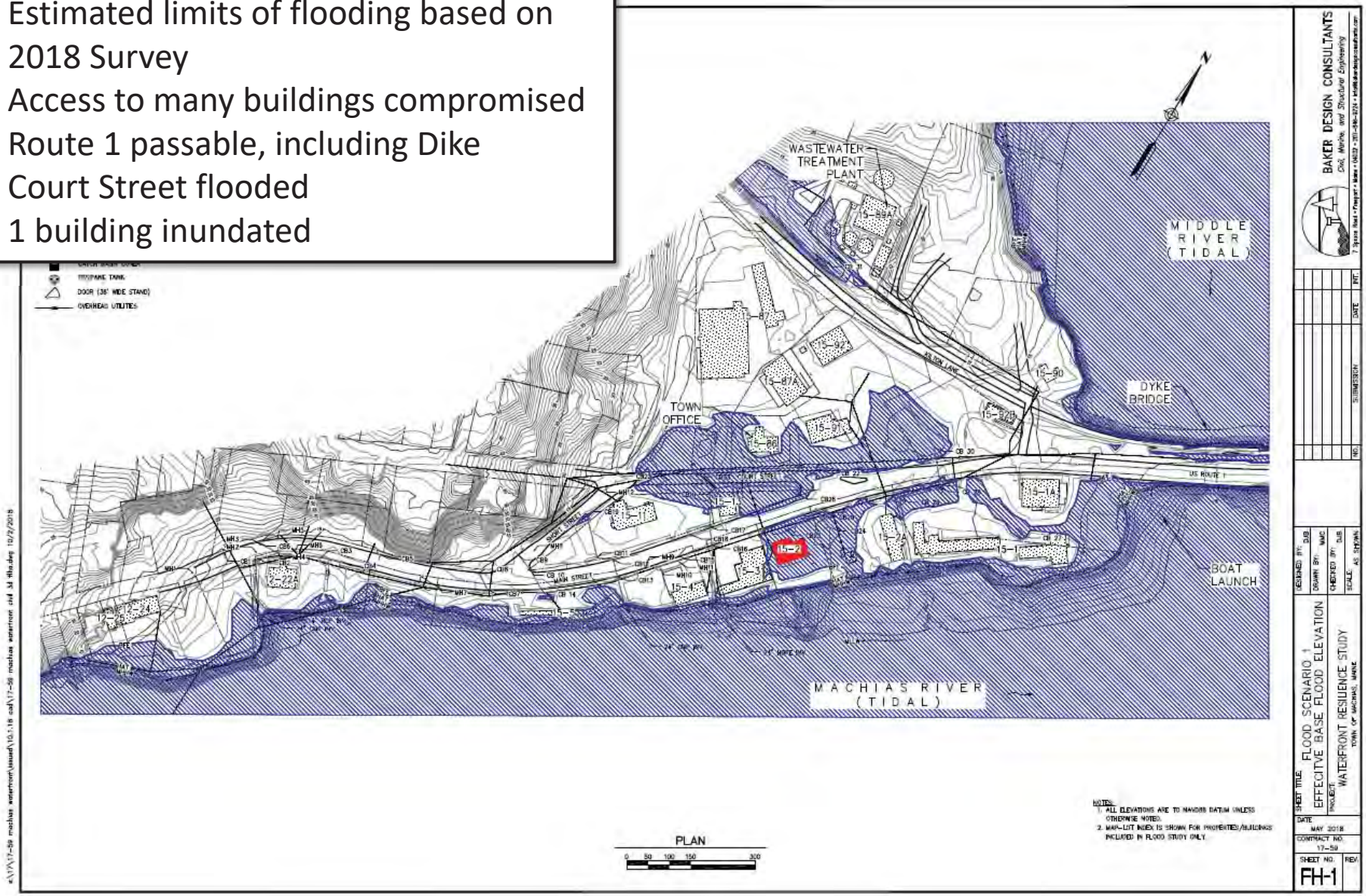
Flood Risk


Special Flood Hazard Area based on Effective Mapping
Areas below BFE based on Spring 2018 Survey
Note:
Areas currently above BFE potentially eligible for removal from SFHA through LOMC/LOMA process
Buildings in Red have FFE<BFE+1'
LEGEND
WASTEWATER TREATMENT PLANT
BFE=11.0
MIDDLE RIVER (TIDAL)
DYKE BRIDGE
TOWN OFFICE
BOAT LAUNCH
MACHIAS RIVER (TIDAL)
PLAN
BAKER DESIGN CONSULTANTS
MAPPED FLOOD HAZARD AREAS AND SURVEYED TOPOGRAPHY
WATERFRONT RESILIENCE STUDY
FH-0

Flood Scenario 1: Effective BFE = 10.7’ NAVD88

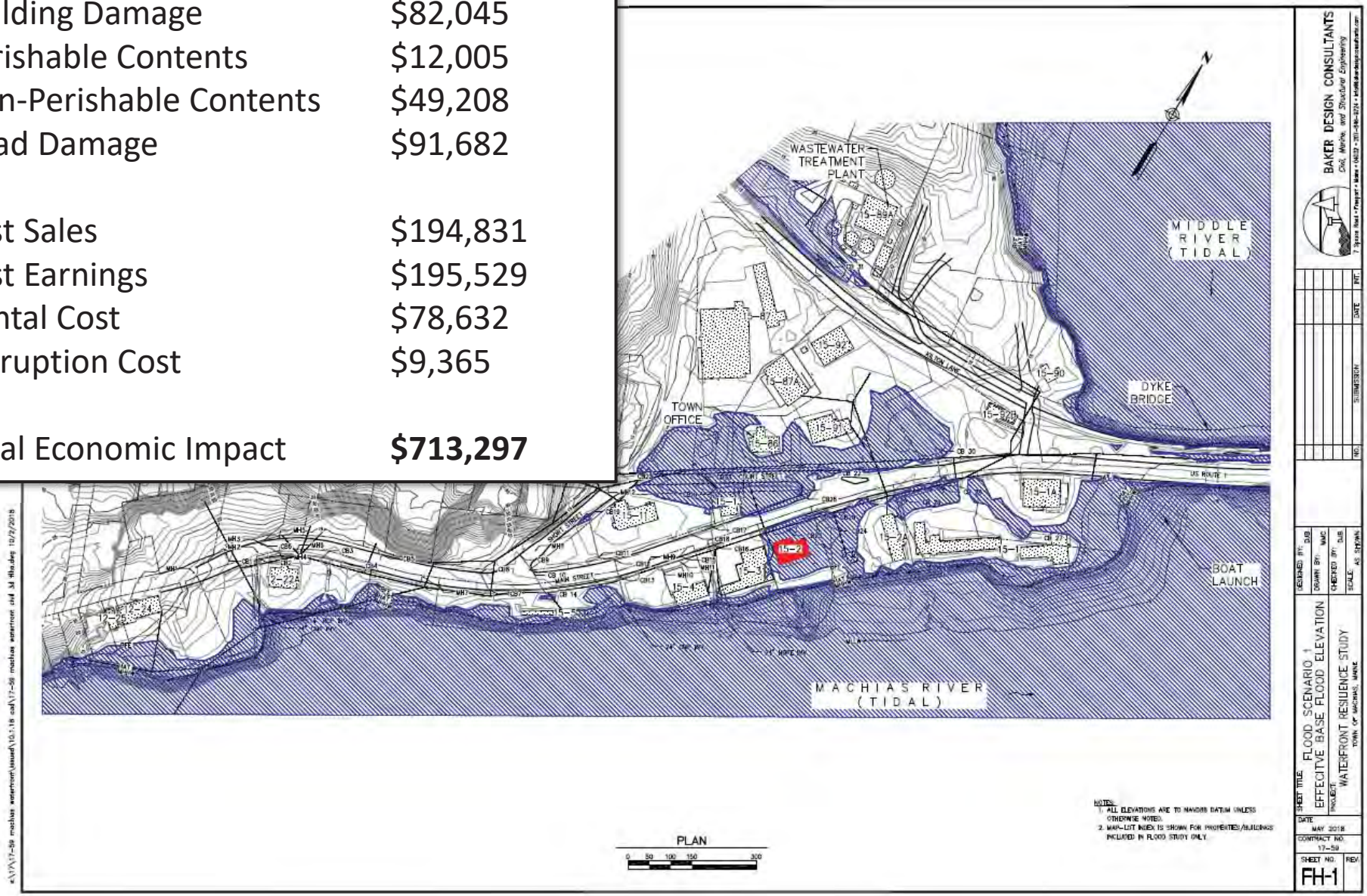
Summary of Impacts

1. Estimated limits of flooding based on 2018 Survey
2. Access to many buildings compromised
3. Route 1 passable, including Dike
4. Court Street flooded
5. 1 building inundated



Flood Scenario 1: Effective BFE = 10.7’ NAVD88

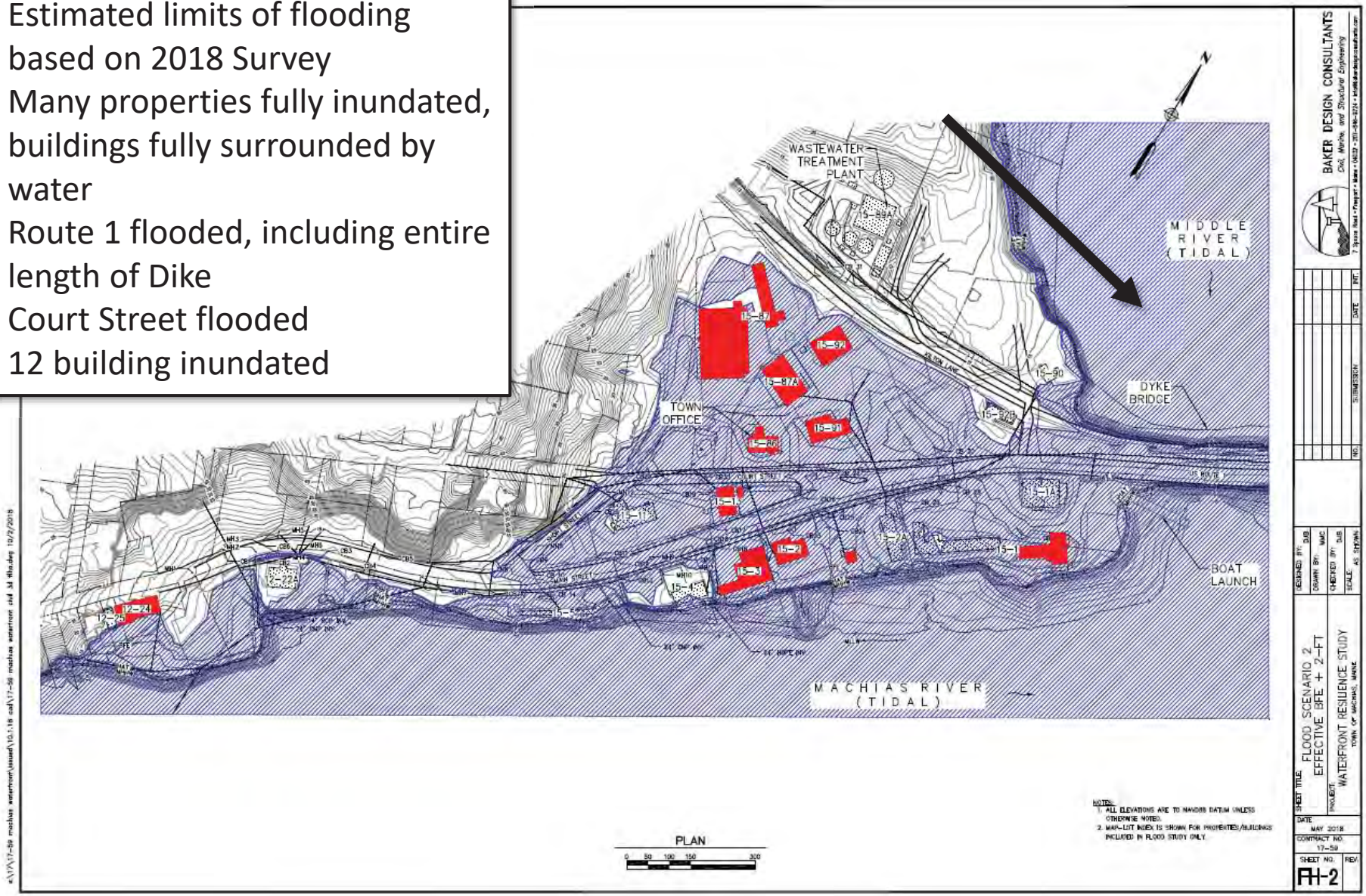
Estimated Losses	
Building Damage	$82,045
Perishable Contents	$12,005
Non-Perishable Contents	$49,208
Road Damage	$91,682
Lost Sales	$194,831
Lost Earnings	$195,529
Rental Cost	$78,632
Disruption Cost	$9,365
Total Economic Impact	**$713,297**



Flood Scenario 2: Effective BFE+2’ = 12.7’ NAVD88

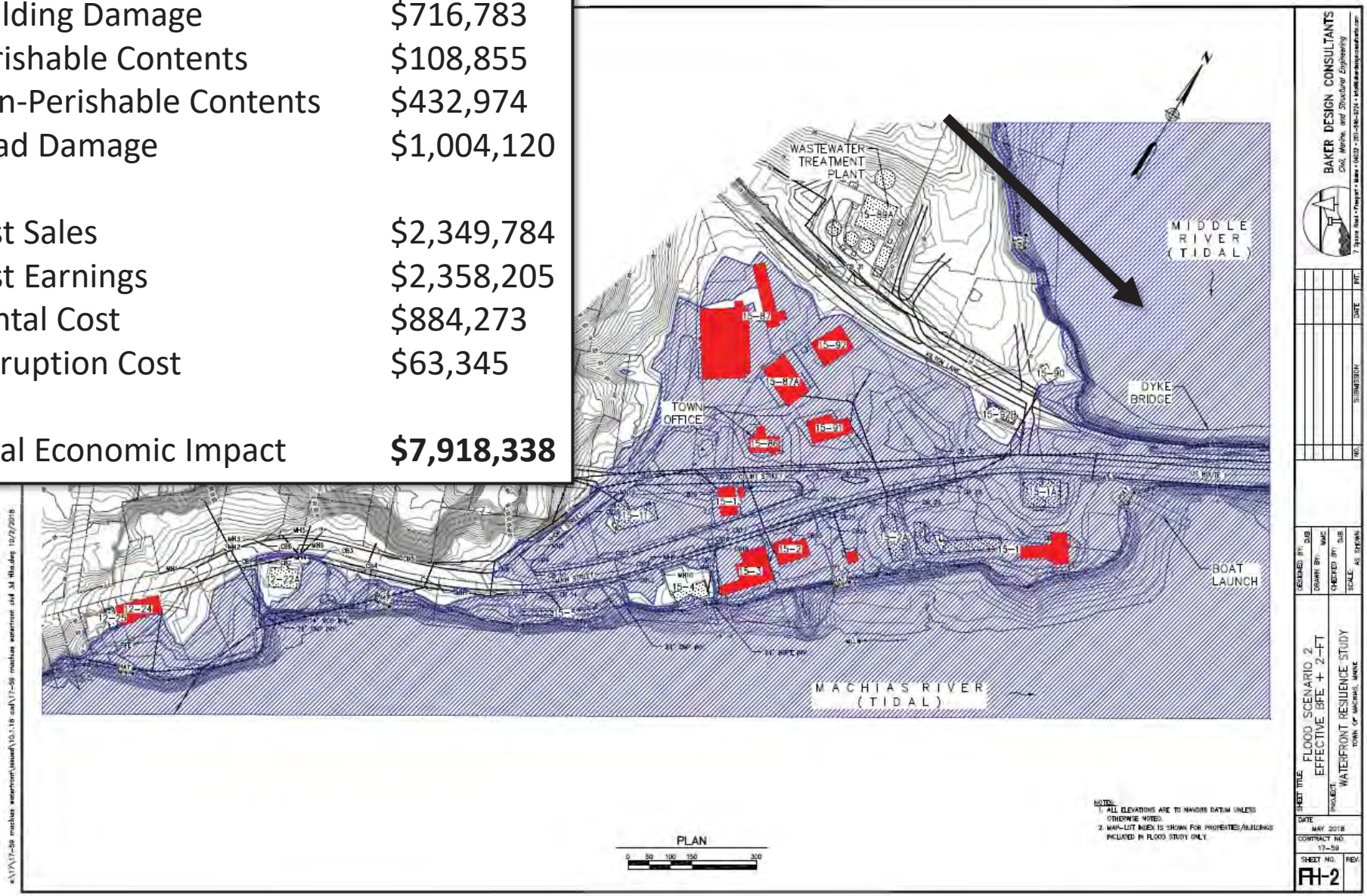
Summary of Impacts

1. Estimated limits of flooding based on 2018 Survey
2. Many properties fully inundated, buildings fully surrounded by water
3. Route 1 flooded, including entire length of Dike
4. Court Street flooded
5. 12 building inundated



Flood Scenario 2: Effective BFE+2’ = 12.7’ NAVD88

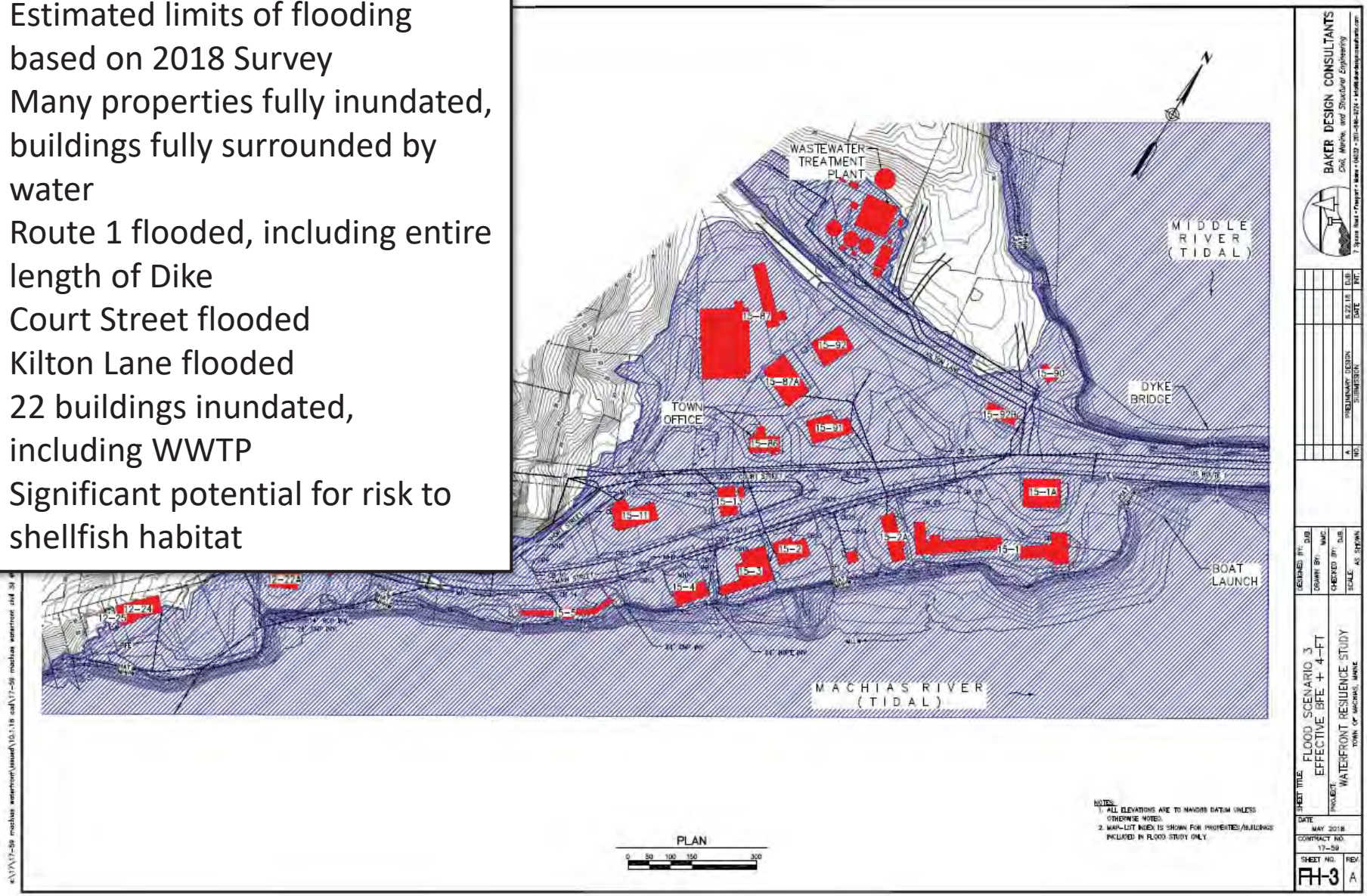
Estimated Losses	
Building Damage	$716,783
Perishable Contents	$108,855
Non-Perishable Contents	$432,974
Road Damage	$1,004,120
Lost Sales	$2,349,784
Lost Earnings	$2,358,205
Rental Cost	$884,273
Disruption Cost	$63,345
Total Economic Impact	**$7,918,338**



Flood Scenario 3: Effective BFE+4’ = 14.7’ NAVD88

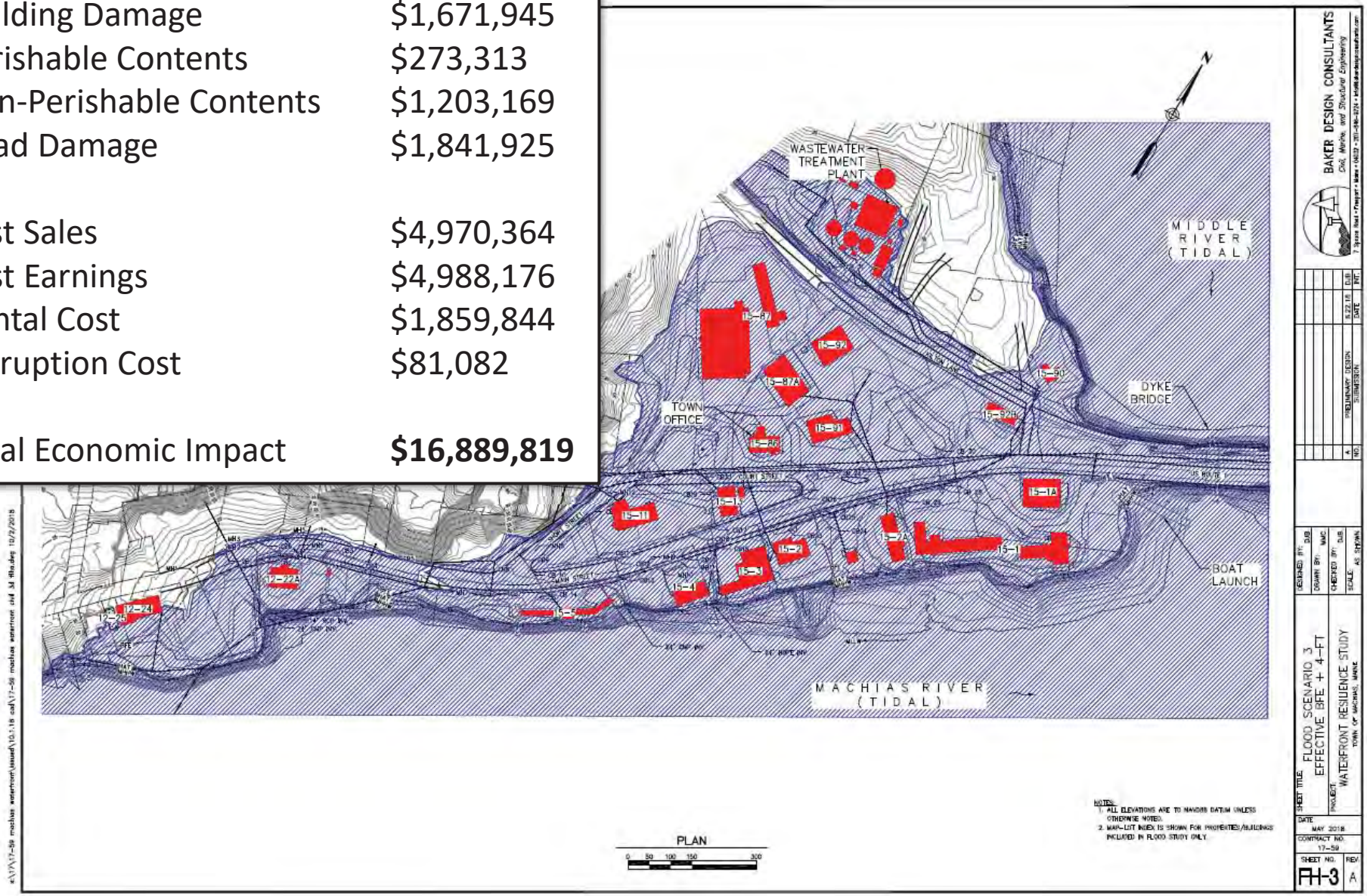
Summary of Impacts

1. Estimated limits of flooding based on 2018 Survey
2. Many properties fully inundated, buildings fully surrounded by water
3. Route 1 flooded, including entire length of Dike
4. Court Street flooded
5. Kilton Lane flooded
6. 22 buildings inundated, including WWTP
7. Significant potential for risk to shellfish habitat



Flood Scenario 3: Effective BFE+4’ = 14.7’ NAVD88

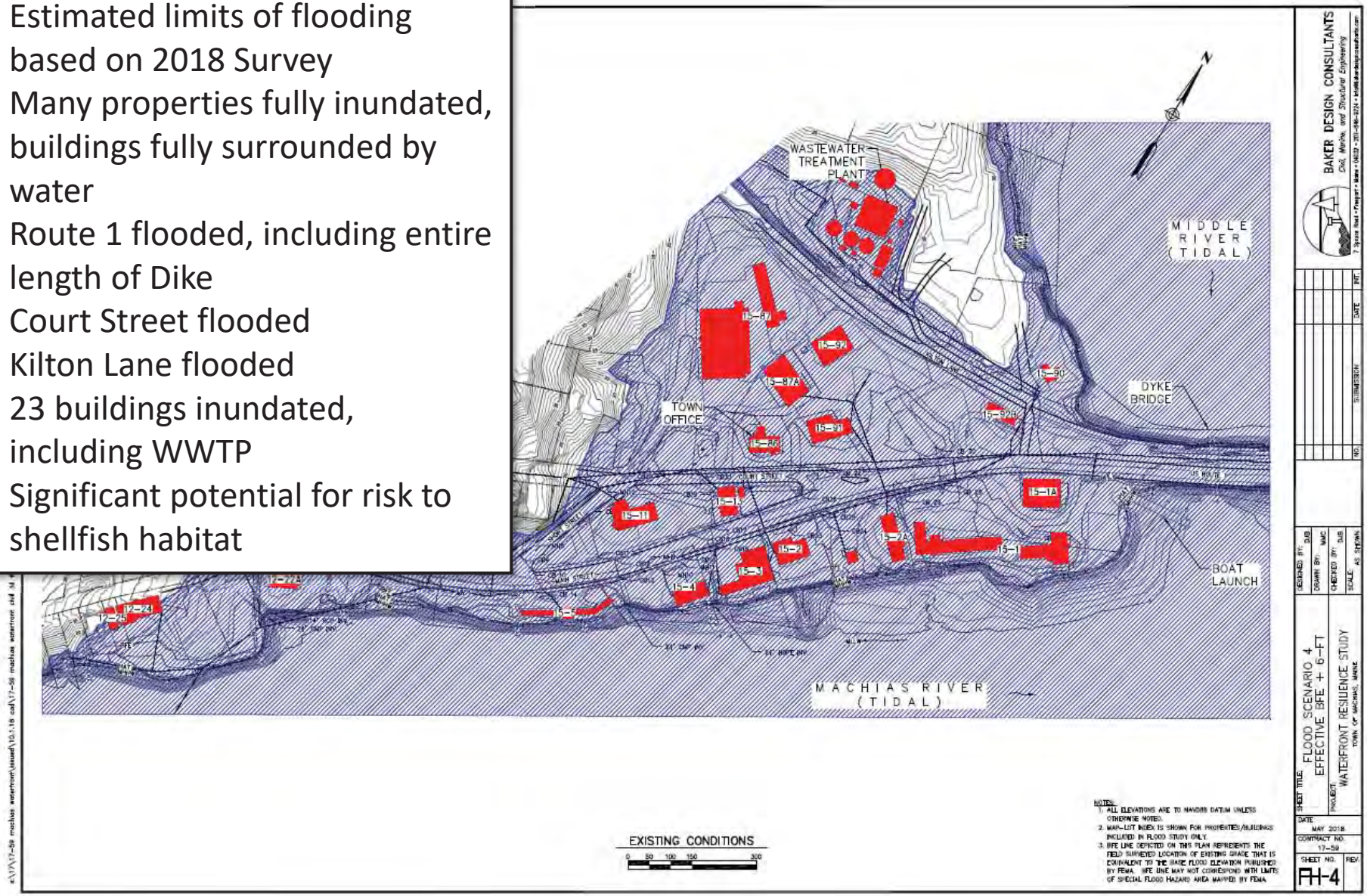
Estimated Losses	
Building Damage	$1,671,945
Perishable Contents	$273,313
Non-Perishable Contents	$1,203,169
Road Damage	$1,841,925
Lost Sales	$4,970,364
Lost Earnings	$4,988,176
Rental Cost	$1,859,844
Disruption Cost	$81,082
Total Economic Impact	**$16,889,819**



Flood Scenario 4: Effective BFE+6’ = 16.7’ NAVD88

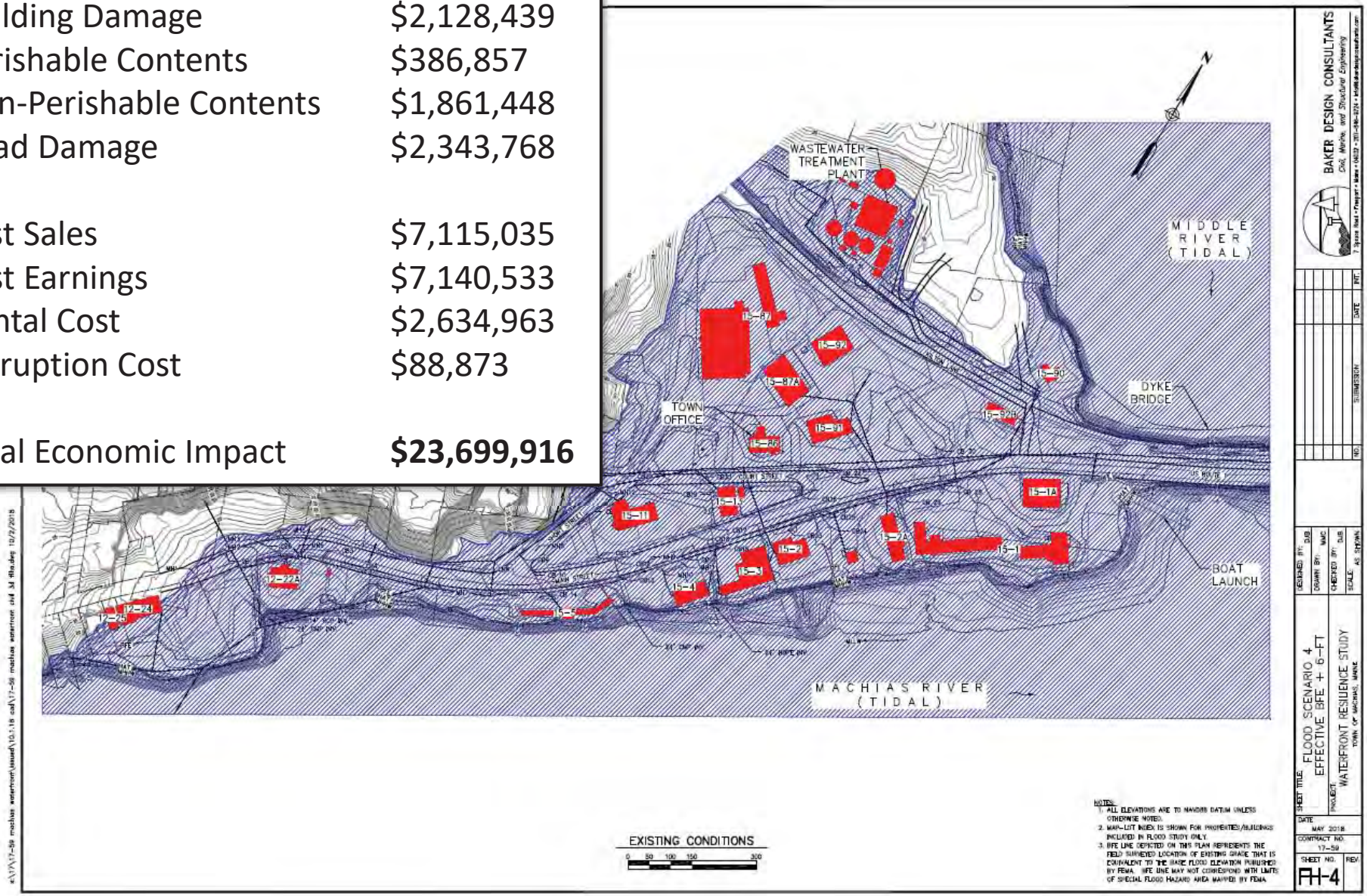
Summary of Impacts

1. Estimated limits of flooding based on 2018 Survey
2. Many properties fully inundated, buildings fully surrounded by water
3. Route 1 flooded, including entire length of Dike
4. Court Street flooded
5. Kilton Lane flooded
6. 23 buildings inundated, including WWTP
7. Significant potential for risk to shellfish habitat



Flood Scenario 4: Effective BFE+6’ = 16.7’ NAVD88

Estimated Losses	
Building Damage	$2,128,439
Perishable Contents	$386,857
Non-Perishable Contents	$1,861,448
Road Damage	$2,343,768
Lost Sales	$7,115,035
Lost Earnings	$7,140,533
Rental Cost	$2,634,963
Disruption Cost	$88,873
Total Economic Impact	**$23,699,916**



Appendix D – Seawall System Program Costs

a. CONCEPT DESIGN CONSTRUCTION COST ESTIMATE; Baker Design Consultants

Seawall System Concept Design
1/30/2019

Baker Design Consultants

Seawall System Refer to Sheet C-2 Typical Sections	Station			Appendix D Sheet Reference	Cost to Address Effective BFE+4 for Entire Downtown (Flood Scenario 3)								
					Walkway		Embankment	Bulkhead	Drainage	MDOT	Boatramp	TOTAL	Per LF
	Start	End	Length		Paved	Elevated							
Perimeter Seawall				G-2									
Option 1-Embankment	0	575	575	C-4	$ 48,683		$ 949,602	NA	$ 86,250			$ 1,084,535	$ 1,886.15
Option 3- Elevated Walkway	575	800	225	C-5		$ 95,850	$ 227,750	$ 441,250	$ 33,750			$ 798,600	$ 3,549.33
Option 1-Embankment	800	1425	625	C-5, C-6	$ 52,917		$ 1,032,176	NA	$ 93,750			$ 1,178,843	$ 1,886.15
Option 2- Bulkhead	1425	2045	620	C-6, C-7, C-8	$ 52,493		$ 640,322	$ 1,215,889	$ 93,000			$ 2,001,704	$ 3,228.56
Option 3- Elevated Walkway	2045	2360	315	C-8, C-9		$ 134,190	$ 318,850	$ 617,750	$ 47,250			$ 1,118,040	$ 3,549.33
Option 1-Embankment	2360	2750	390	C-9	$ 33,020		$ 644,078	NA	$ 58,500			$ 735,598	$ 1,886.15
WWTP North Embankment	0	750	750	C-10	$ -		$ 366,944					$ 366,944	$ 489.26
BoatRamp Reconstruction	2750	2800	50	C-11							$ 78,379	$ 78,379	$ 1,567.57
Route 1 MDOT Approaches Assumes Road reconstruction part of Dyke recinstruction Project	2800	2900	100	C-12						$ 94,950		$ 94,950	$ 949.50
TOTAL			3650	$ -	$ 187,113	$ 230,040	$ 4,179,722	$ 2,274,889	$ 412,500	$ 94,950	$ 78,379	$ 7,457,593	$ 2,043.18
with 50% Engineering, Permitting and Contingency												$ 11,186,389	$ 3,064.76

Appendix E –Seawall System Concept Design Drawings

Seawall System Concept Design Solution

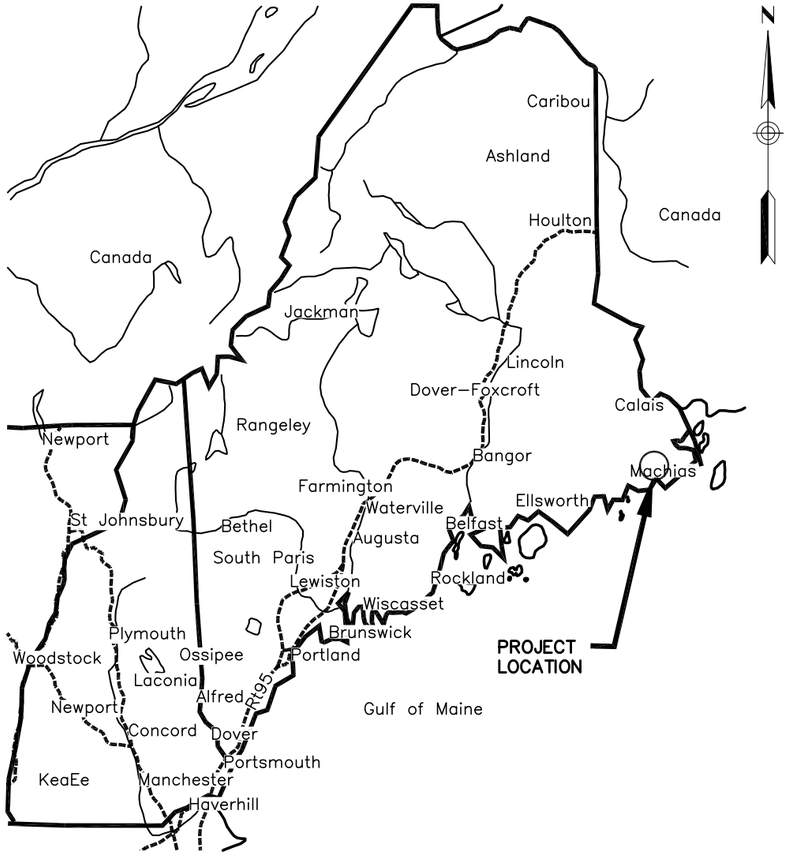
G-1 COVERSHEET
G-2 OVERVIEW PLAN

C-1 EXISTING CONDITIONS
C-2 CURRENT LAND USE
C-3 TYPICAL SEAWALL SECTIONS
C-4 SEAWALL PLAN & PROFILE: PANEL 1; Sta 0+00 to 6+40
C-5 SEAWALL PLAN & PROFILE: PANEL 2; Sta 5+00 to 11+50
C-6 SEAWALL PLAN & PROFILE: PANEL 3; Sta 11+00 to 16+50
C-7 SEAWALL PLAN & PROFILE: PANEL 4; Sta 16+00 to 16+50
C-8 SEAWALL PLAN & PROFILE: PANEL 5; Sta 16+20 to 22+00
C-9 SEAWALL PLAN & PROFILE: PANEL 6; Sta 22+00 to 28+75
C-10 SEAWALL PLAN & PROFILE: PANEL 7; Treatment Plant Cut-off Wall
C-11 SEAWALL PLAN & PROFILE: BOAT RAMP
C-12 SEAWALL PLAN & PROFILE: ROUTE 1

WATERFRONT RESILIENCE STUDY

SEAWALL SYSTEM CONCEPT DESIGN; PROTECTION TO BFE + 4FT

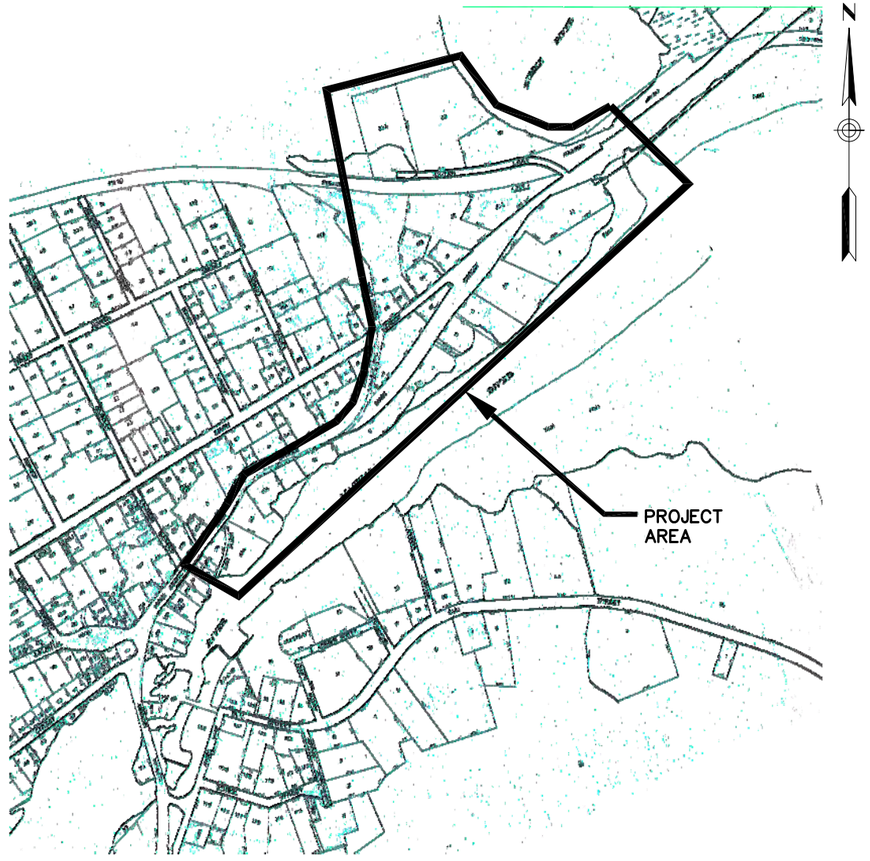
TOWN OF MACHIAS, MAINE
PROJECT NO. 17-59



LOCATION MAP

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G-1	COVERSHEET
G-2	OVERVIEW PLAN
C-1	EXISTING CONDITIONS
C-2	FLOOD HAZARD AREAS
C-3	TYPICAL SEAWALL SECTIONS
C-4	PLAN & PROFILE: PANEL 1
C-5	PLAN & PROFILE: PANEL 2
C-6	PLAN & PROFILE: PANEL 3
C-7	PLAN & PROFILE: PANEL 4
C-8	PLAN & PROFILE: PANEL 5
C-9	PLAN & PROFILE: PANEL 6
C-10	PLAN & PROFILE: PANEL 7
C-11	PLAN & PROFILE: BOAT RAMP
C-12	PLAN & PROFILE: ROUTE 1



MACHIAS TAX MAP COMPOSITE

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NO.	DATE	INT.
A	1.23.19	BJB
	FINAL REPORT	
	SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	CHECKED BY:	DJB
DRAWN BY:	MMC	SCALE:	AS SHOWN

SHEET TITLE: COVERSHEET

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018

CONTRACT NO. 17-59

SHEET NO. G-1 | REV. A

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront general.dwg 1/25/2019

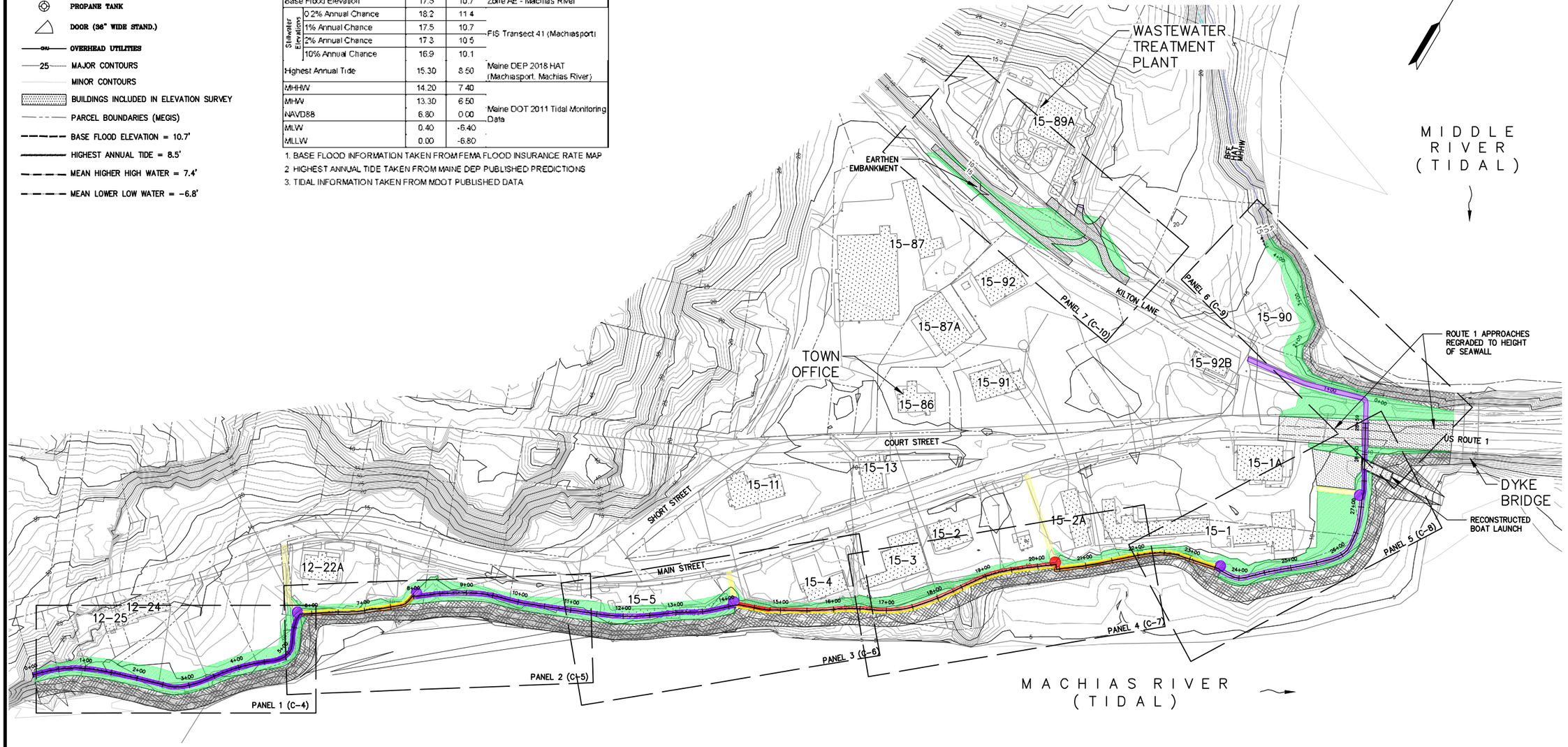
LEGEND

- UTILITY POLE
- ELEVATION SPOT SHOT
- SANITARY SEWER MANHOLE
- STORM DRAINAGE MANHOLE
- MANHOLE COVER
- CATCH BASIN COVER
- PROPANE TANK
- DOOR (36" WIDE STAND.)
- OHU — OVERHEAD UTILITIES
- 25 — MAJOR CONTOURS
- MINOR CONTOURS
- BUILDINGS INCLUDED IN ELEVATION SURVEY
- PARCEL BOUNDARIES (MEGIS)
- BASE FLOOD ELEVATION = 10.7'
- HIGHEST ANNUAL TIDE = 8.5'
- MEAN HIGHER HIGH WATER = 7.4'
- MEAN LOWER LOW WATER = -6.8'

PROJECT ELEVATIONS (BY DATUM)

ELEVATION		CHART (ft)	Machias NAVD88 (ft)	Notes
Base Flood Elevation		17.8	11.0	Zone AE - Upper Middle River and Adjacent WWTP
Blizzard of 1978 Water Elevation		17.6	10.8	USGS Report
Base Flood Elevation		17.5	10.7	Zone AE - Machias River
Stillwater Elevations	0.2% Annual Chance	18.2	11.4	FIS Transect 41 (Machiasport)
	1% Annual Chance	17.5	10.7	
	2% Annual Chance	17.3	10.5	
	10% Annual Chance	16.9	10.1	
Highest Annual Tide		15.30	8.50	Maine DEP 2018 HAT (Machiasport, Machias River)
MHHW		14.20	7.40	
MHW		13.30	6.50	Maine DOT 2011 Tidal Monitoring Data
NAVD88		6.80	0.00	
MLW		0.40	-6.40	
MLLW		0.00	-6.80	

1. BASE FLOOD INFORMATION TAKEN FROM FEMA FLOOD INSURANCE RATE MAP
2. HIGHEST ANNUAL TIDE TAKEN FROM MAINE DEP PUBLISHED PREDICTIONS
3. TIDAL INFORMATION TAKEN FROM MDOT PUBLISHED DATA



OVERVIEW PLAN
0 50 100 150 300

NOTES:
1. ALL ELEVATIONS ARE TO NAVD88 DATUM UNLESS OTHERWISE NOTED.
2. SEAWALL SYSTEM CONCEPT DESIGN IS SHOWN. MORE DETAIL PROVIDED WITH REFERENCE

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NO.	DATE	BY
A	1.23.19	BJB
B	10.15.18	BJB
	FINAL REPORT 10.15.18 MEETING SUBMISSION	INT.

STATE OF MAINE — BARNEY J. BAKER No. 5737 — LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: OVERVIEW PLAN PROTECTION TO BFE+4 FT

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN WATERFRONT RESILIENCE STUDY TOWN OF MACHIAS, MAINE

DATE: MAY 2018

CONTRACT NO. 17-59

SHEET NO. G-2 | REV. B

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

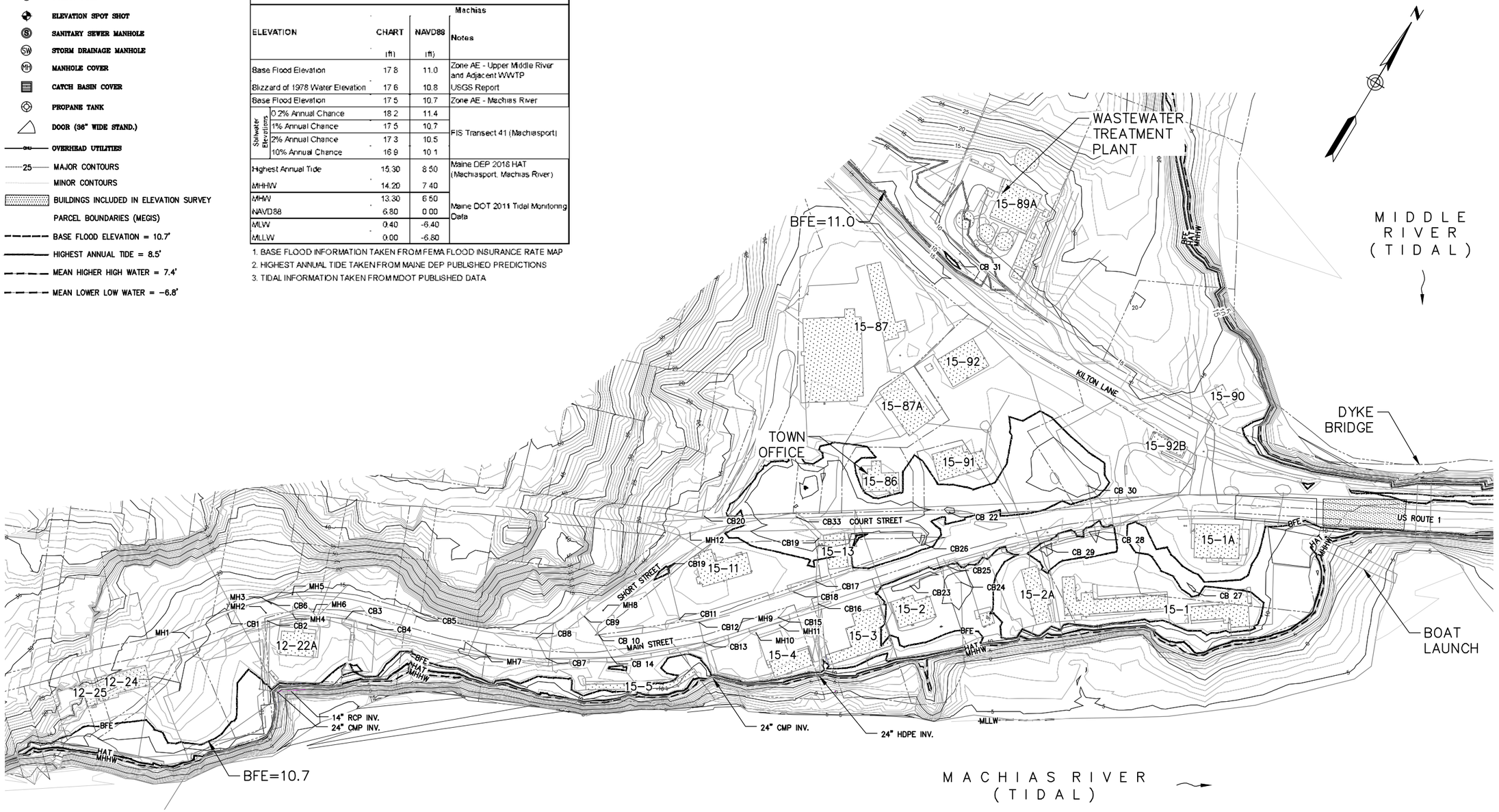
LEGEND

- UTILITY POLE
- ELEVATION SPOT SHOT
- SANITARY SEWER MANHOLE
- STORM DRAINAGE MANHOLE
- MANHOLE COVER
- CATCH BASIN COVER
- PROPANE TANK
- DOOR (36" WIDE STAND.)
- OHU OVERHEAD UTILITIES
- 25 MAJOR CONTOURS
- MINOR CONTOURS
- BUILDINGS INCLUDED IN ELEVATION SURVEY
- PARCEL BOUNDARIES (MEGIS)
- BASE FLOOD ELEVATION = 10.7'
- HIGHEST ANNUAL TIDE = 8.5'
- MEAN HIGHER HIGH WATER = 7.4'
- MEAN LOWER LOW WATER = -6.8'

PROJECT ELEVATIONS (BY DATUM)

ELEVATION		CHART (ft)	NAVD88 (ft)	Machias Notes
Base Flood Elevation		17.8	11.0	Zone AE - Upper Middle River and Adjacent WWTP
Blizzard of 1978 Water Elevation		17.6	10.8	USGS Report
Base Flood Elevation		17.5	10.7	Zone AE - Machias River
Stillwater Elevations	0.2% Annual Chance	18.2	11.4	FIS Transect 41 (Machiasport)
	1% Annual Chance	17.5	10.7	
	2% Annual Chance	17.3	10.5	
	10% Annual Chance	16.9	10.1	
Highest Annual Tide		15.30	8.50	Maine DEP 2018 HAT (Machiasport, Machias River)
MHHW		14.20	7.40	
MHW		13.30	6.50	Maine DOT 2011 Tidal Monitoring Data
NAVD88		6.80	0.00	
MLW		0.40	-6.40	
MLLW		0.00	-6.80	

1. BASE FLOOD INFORMATION TAKEN FROM FEMA FLOOD INSURANCE RATE MAP
2. HIGHEST ANNUAL TIDE TAKEN FROM MAINE DEP PUBLISHED PREDICTIONS
3. TIDAL INFORMATION TAKEN FROM MDOT PUBLISHED DATA



EXISTING CONDITIONS

0 50 100 150 300

NOTES:
1. ALL ELEVATIONS ARE TO NAVD88 DATUM UNLESS OTHERWISE NOTED.
2. MAP-LOT INDEX IS SHOWN FOR PROPERTIES/BUILDINGS INCLUDED IN FLOOD STUDY ONLY.
3. BFE LINE DEPICTED ON THIS PLAN REPRESENTS THE FIELD SURVEYED LOCATION OF EXISTING GRADE THAT IS EQUIVALENT TO THE BASE FLOOD ELEVATION PUBLISHED BY FEMA. BFE LINE MAY NOT CORRESPOND WITH LIMITS OF SPECIAL FLOOD HAZARD AREA MAPPED BY FEMA.

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NO.		DATE	INT.
A	FINAL REPORT	1.23.19	BJB
B	PRELIMINARY DESIGN SUBMISSION	6.22.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: EXISTING CONDITIONS

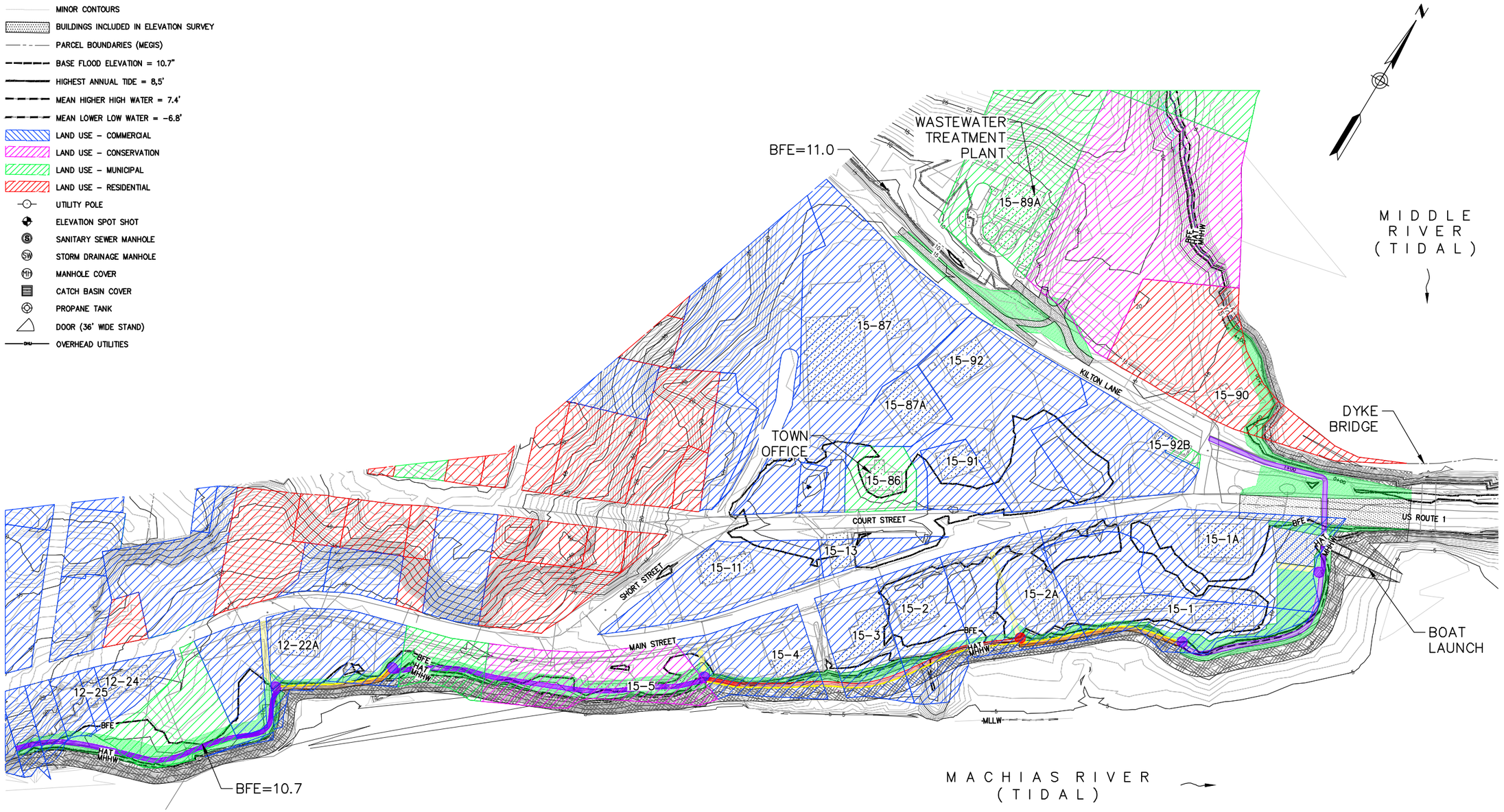
PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018
CONTRACT NO.: 17-59
SHEET NO.: C-1
REV.: B

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

LEGEND

- 25 — MAJOR CONTOURS
- MINOR CONTOURS
- BUILDINGS INCLUDED IN ELEVATION SURVEY
- PARCEL BOUNDARIES (MEGIS)
- BASE FLOOD ELEVATION = 10.7'
- HIGHEST ANNUAL TIDE = 8.5'
- MEAN HIGHER HIGH WATER = 7.4'
- MEAN LOWER LOW WATER = -6.8'
- LAND USE – COMMERCIAL
- LAND USE – CONSERVATION
- LAND USE – MUNICIPAL
- LAND USE – RESIDENTIAL
- UTILITY POLE
- ELEVATION SPOT SHOT
- SANITARY SEWER MANHOLE
- STORM DRAINAGE MANHOLE
- MANHOLE COVER
- CATCH BASIN COVER
- PROPANE TANK
- DOOR (36" WIDE STAND)
- OHU — OVERHEAD UTILITIES



PLAN

0 50 100 150 300

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

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NO.	DATE	
A	10.15.18	FINAL REPORT
B	1.23.19	10.15.18 PRESENTATION SUBMISSION

STATE OF MAINE — BARNEY J. BAKER No. 5737 — LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

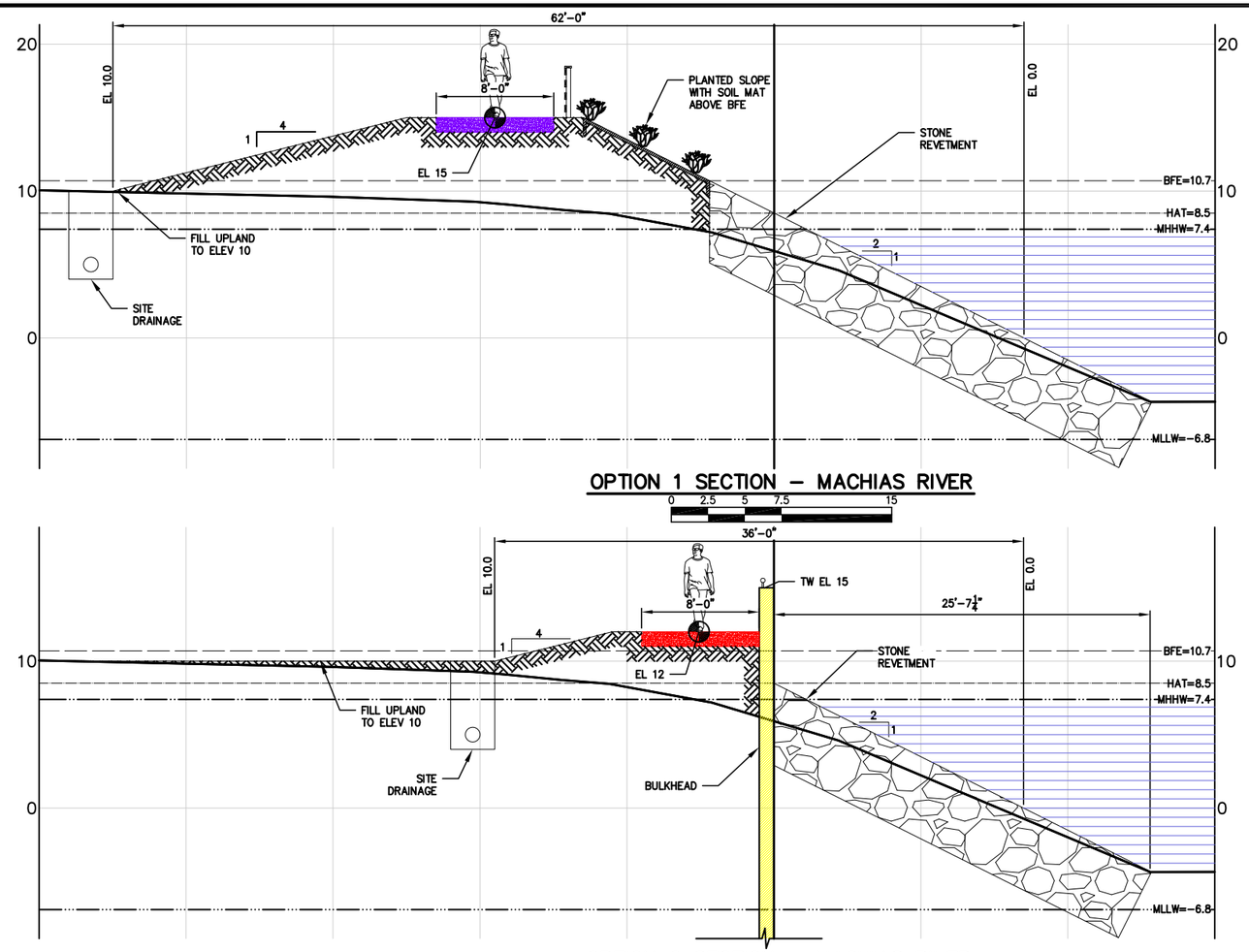
SHEET TITLE: CURRENT LAND USE

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018

CONTRACT NO. 17-59

SHEET NO. C-2 | REV. B

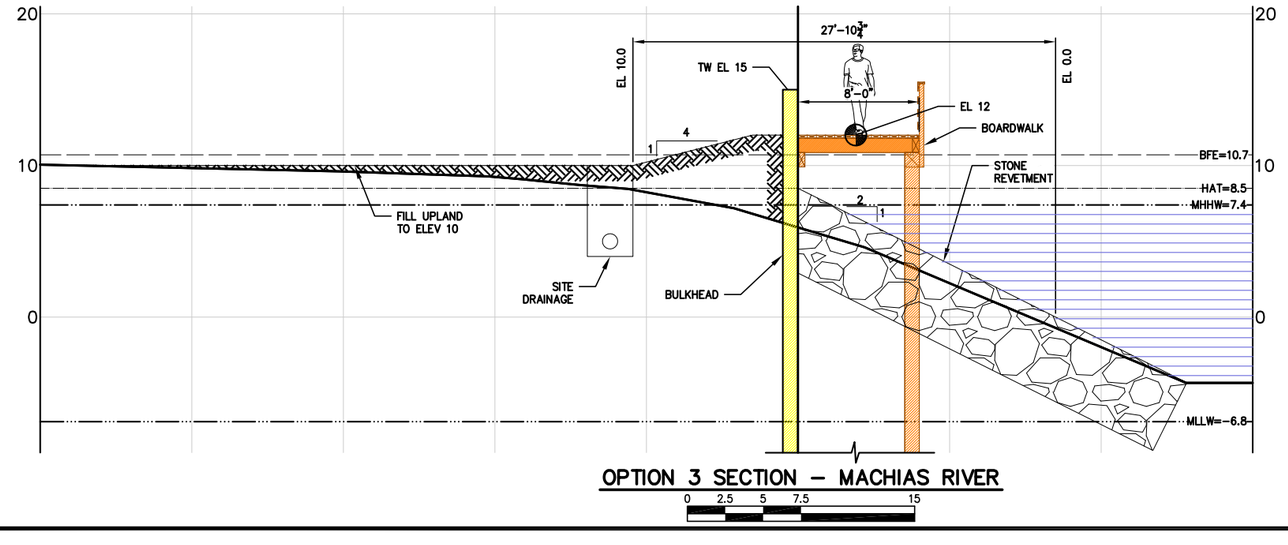


OPTION 1 SECTION – MACHIAS RIVER

0 2.5 5 7.5 15

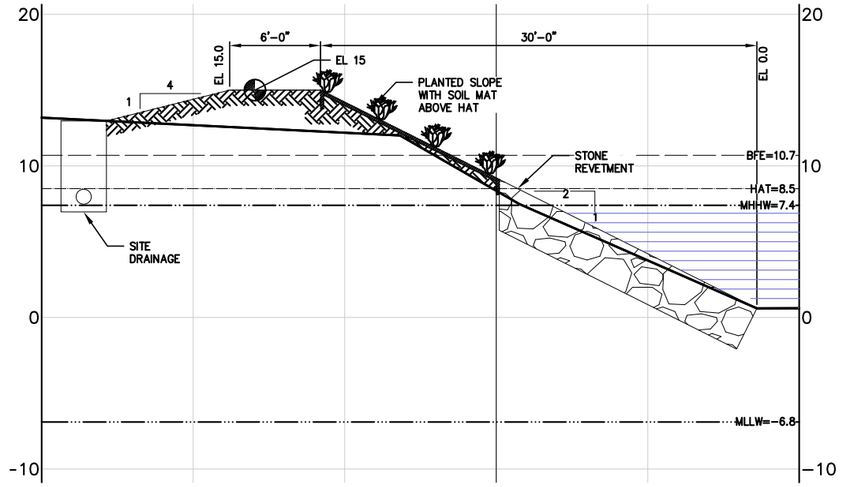
OPTION 2 SECTION – MACHIAS RIVER

0 2.5 5 7.5 15



OPTION 3 SECTION – MACHIAS RIVER

0 2.5 5 7.5 15



NORTH SECTION – MIDDLE RIVER

0 2.5 5 7.5 15

NOTES:
1. SECTIONS ARE COMBINED FOR A CONTIGUOUS SEAWALL SYSTEM.
2. REFER TO SHEETS C-4 TO C-12 FOR SECTION LOCATION.

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A	FINAL REPORT SUBMISSION	1.23.19	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
BJB	MMC	BJB	AS SHOWN

SHEET TITLE: TYPICAL SEAWALL SECTIONS

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018

CONTRACT NO.: 17-59

SHEET NO.: C-3

REV.: A

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PANEL 1 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

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B	FINAL REPORT	1.23.19	BJB
A	10.15.18 MEETING SUBMISSION	10.15.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PANEL 1 PLAN

PROJECT: WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE
MAY 2018

CONTRACT NO.
17-59

SHEET NO. C-4
REV. B

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

PANEL 2 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

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NO.	DATE	INT.
B	1.23.19	BJB
A	10.15.18	BJB
	FINAL REPORT	
	10.15.18 MEETING	
	SUBMISSION	

BARNEY J. BAKER No. 5737 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
BJB	MMC	BJB	AS SHOWN

SHEET TITLE: PANEL 2 PLAN

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018

CONTRACT NO. 17-59

SHEET NO. C-5 | REV. B

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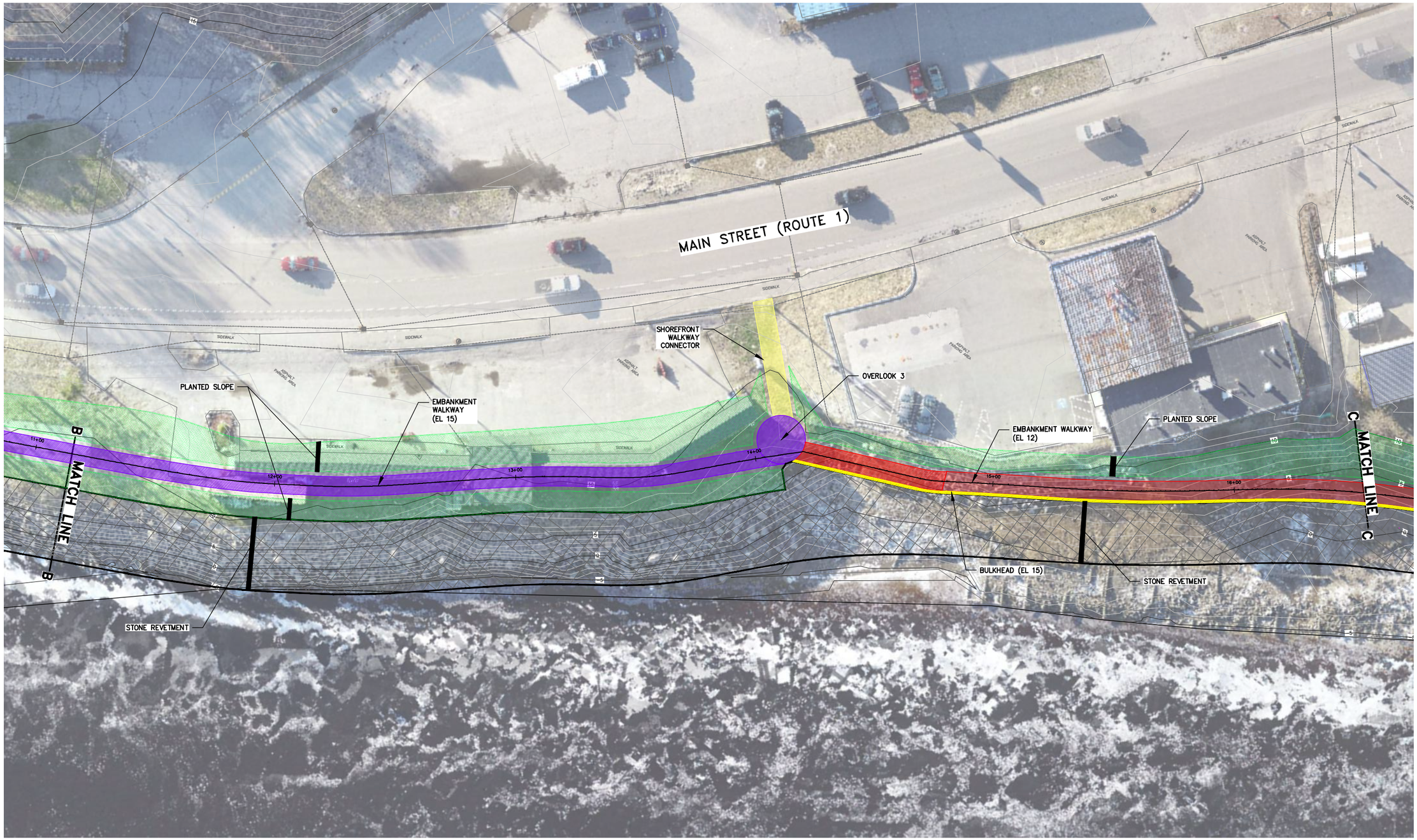

PANEL 3 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

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NO.	DATE	BJB
A	10.15.18	BJB
B	1.23.19	BJB
	FINAL REPORT	
	10.15.18 MEETING SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PANEL 3 PLAN

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE
MAY 2018

CONTRACT NO.
17-59

SHEET NO. C-6

REV. B

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PANEL 4 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

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NO.	DATE	INT.
B	10.19.18	BJB
A	10.15.18 MEETING SUBMISSION	BJB
	FINAL REPORT	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PANEL 4 PLAN

PROJECT: WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE
MAY 2018

CONTRACT NO.
17-59

SHEET NO. C-7

REV. B

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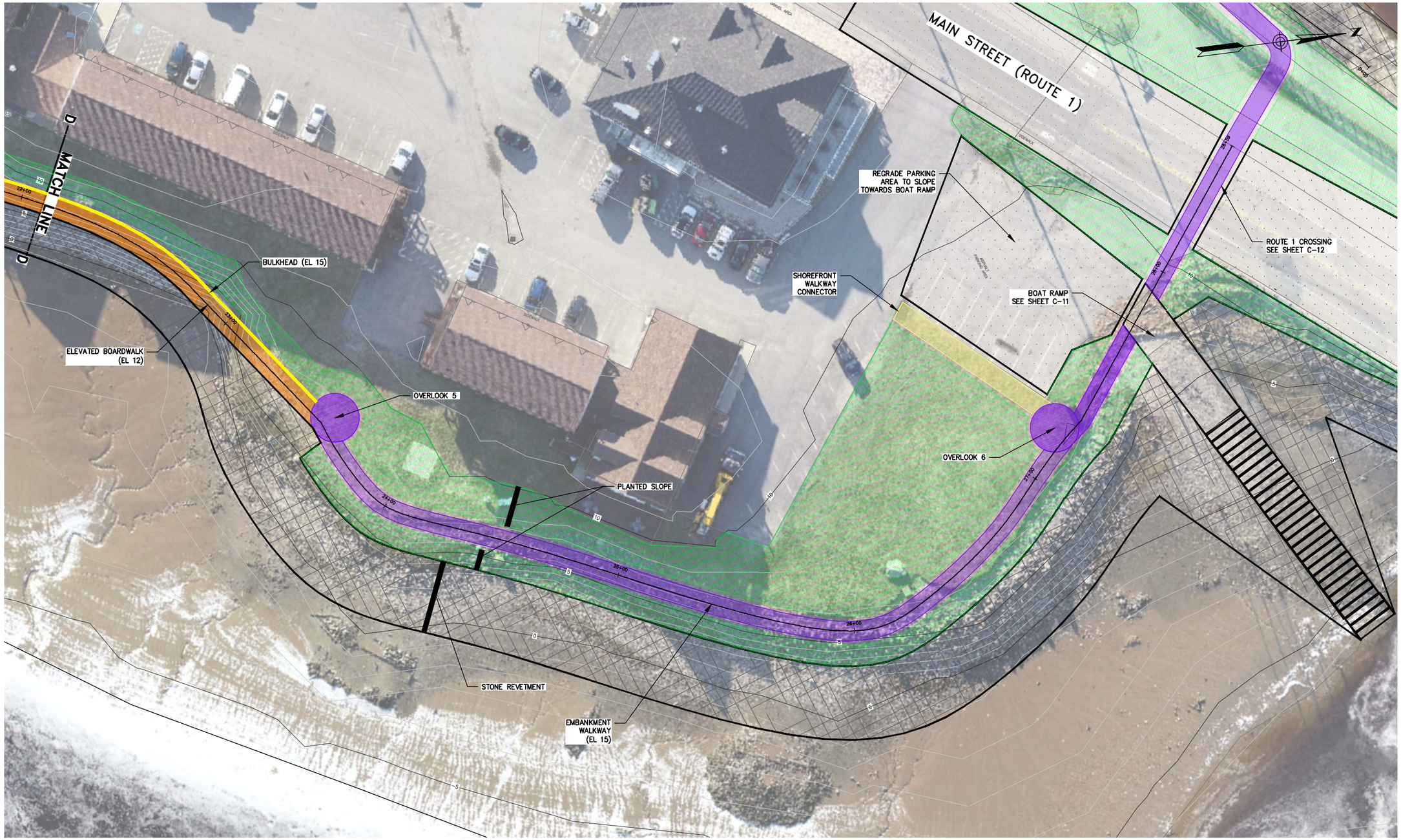

PANEL 5 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

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NO.	DATE	INT.
B	1.23.19	BJB
A	10.15.18	BJB
	FINAL REPORT	
	10.15.18 MEETING SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PANEL 5 PLAN

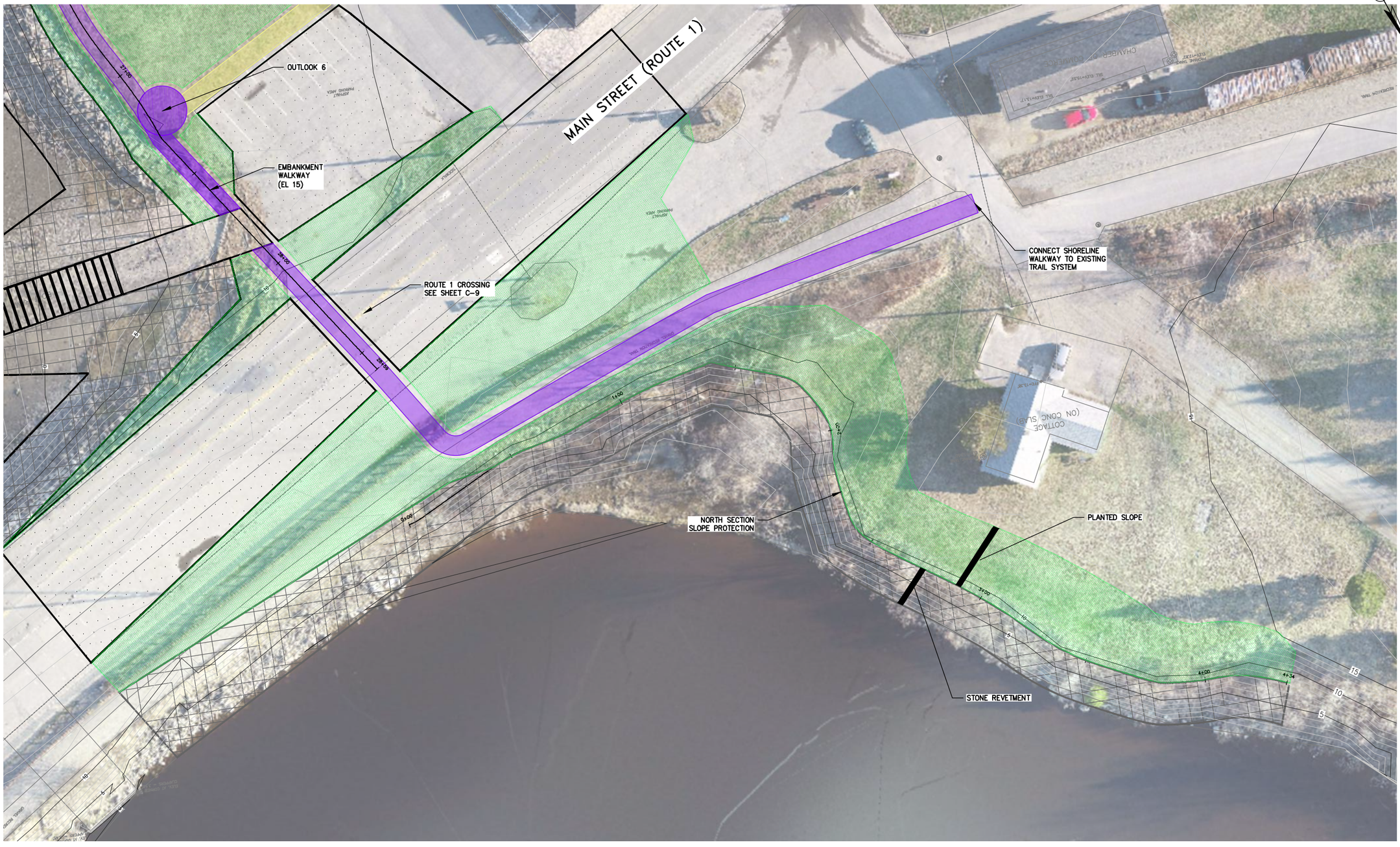
PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE
MAY 2018

CONTRACT NO.
17-59

SHEET NO. C-8

REV. B



PANEL 6 PLAN

0 10 20 30 60

NOTES:
1. REFER TO TYPICAL SEAWALL SECTIONS ON SHEET C-3.

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

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NO.	DATE	INT.
A	10.15.18	BJB
B	1.23.19	BJB
	FINAL REPORT	
	10.15.18 MEETING SUBMISSION	

BARNEY J. BAKER No. 5737 STATE OF MAINE LICENSED PROFESSIONAL ENGINEER

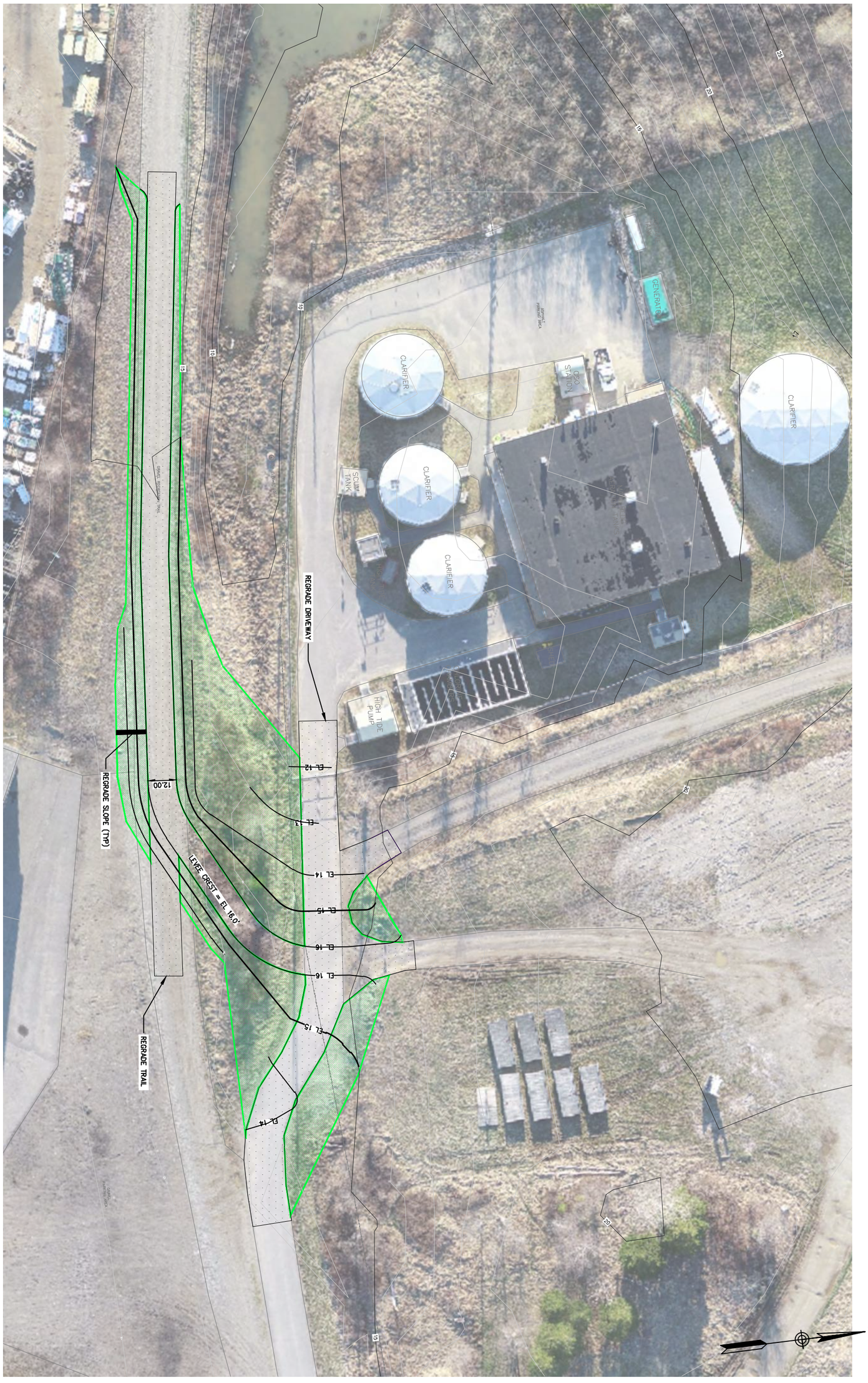
DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PANEL 6 PLAN

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE: MAY 2018
CONTRACT NO.: 17-59
SHEET NO.: C-9
REV.: B

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019



PANEL 7 PLAN

B	FINAL REPORT	1.23.19	BJB
A	10.15.18 MEETING	10.15.18	BJB
NO.	SUBMISSION	DATE	INT.

SHEET TITLE: PANEL 7 PLAN

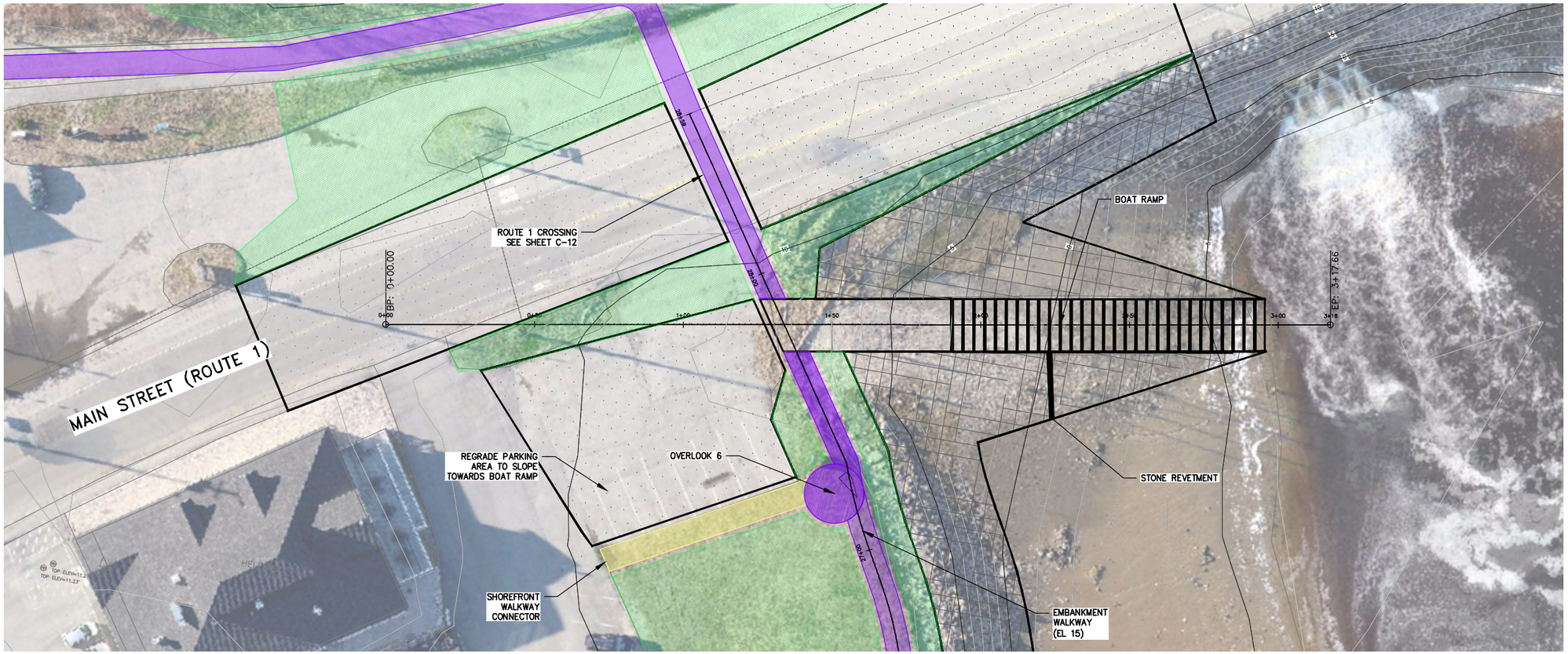
PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

DATE: MAY 2018
CONTRACT NO. 17-59
SHEET NO. C-10
REV. B

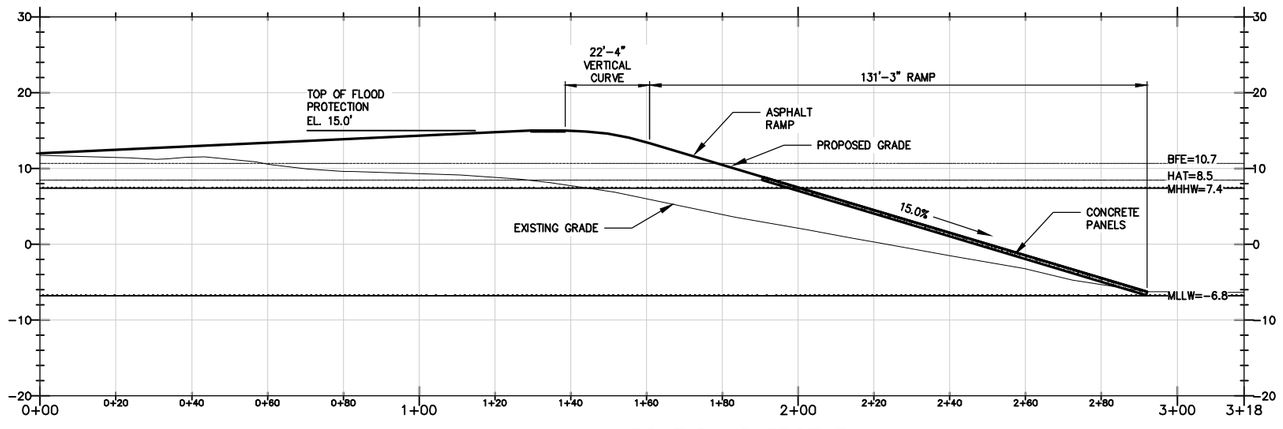
STATE OF MAINE
BARNEY A. BAKER
No. 5037
REGISTERED PROFESSIONAL ENGINEER

BAKER DESIGN CONSULTANTS
Civil, Marine, and Structural Engineering
7 Spruce Road • Freeport • Maine • 04032 • 207-846-9724 • info@bakerdesignconsultants.com



BOAT RAMP PLAN

0 10 20 30 60



VERTICAL:HORIZONTAL
EXAGGERATION = 2:1

BOAT RAMP PROFILE

0 10 20 30 60

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

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NO.	DATE	BY
A	PRELIMINARY DESIGN SUBMISSION	6.22.18	BJB
B	FINAL REPORT	1.23.19	BJB
			INT.

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: MMC
CHECKED BY: BJB
SCALE: AS SHOWN

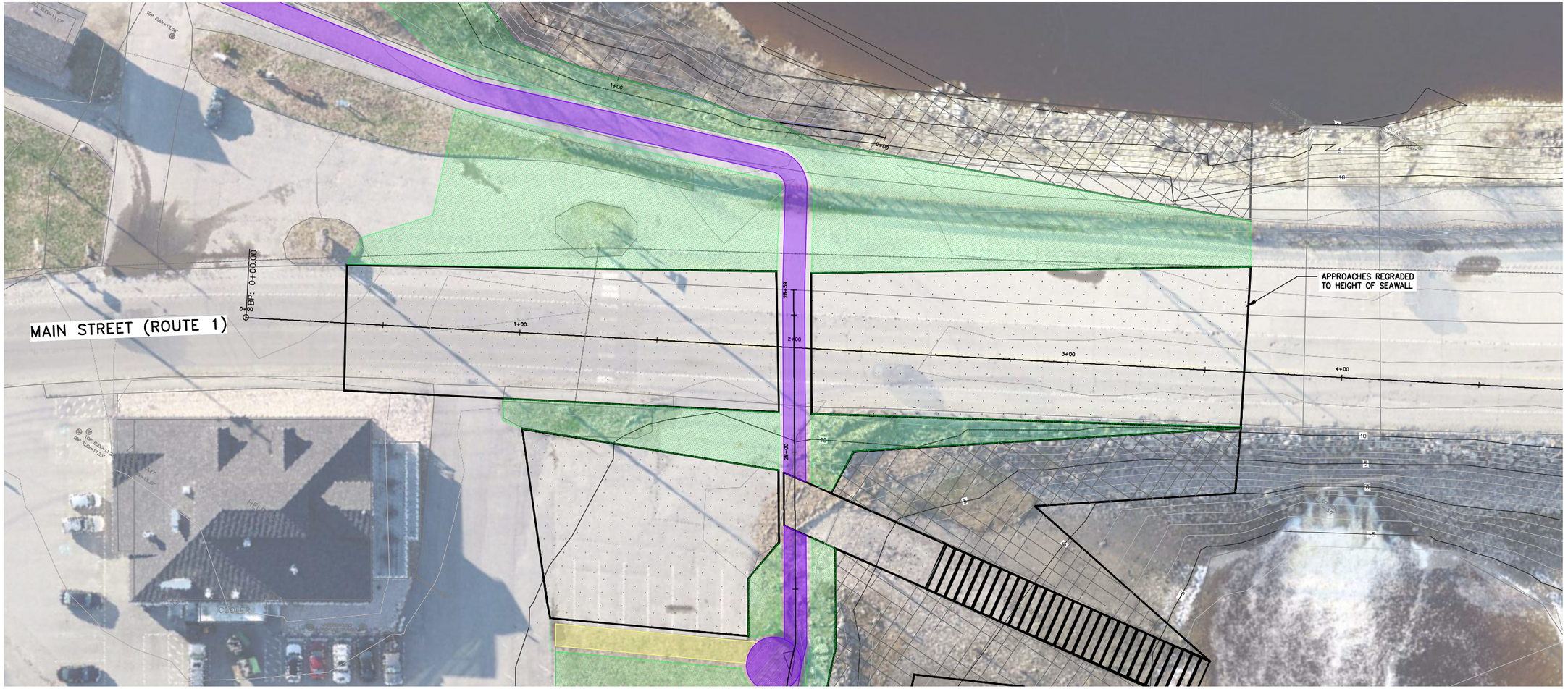
SHEET TITLE: PLAN & PROFILE BOAT RAMP

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

DATE
MAY 2018

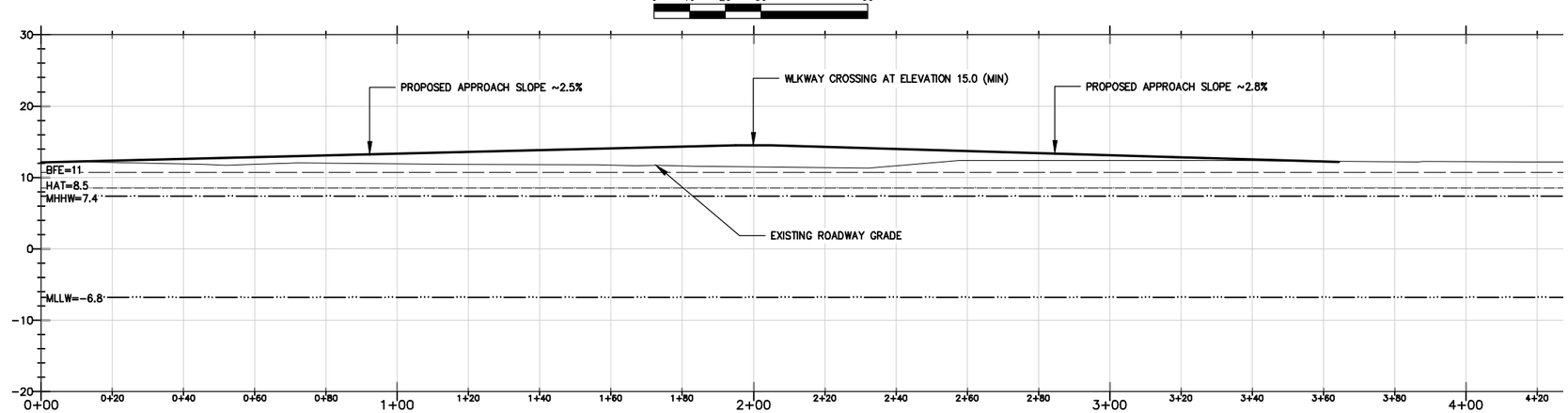
CONTRACT NO.
17-59

SHEET NO. C-11
REV. B



ROADWAY PLAN

0 10 20 30 60



VERTICAL: HORIZONTAL
EXAGGERATION = 2:1

ROUTE 1 PROFILE

0 10 20 30 60

x:\17\17-59 machias waterfront\cad\17-59 machias waterfront civil 3d.dwg 1/28/2019

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NO.		DATE	INT.
A	FINAL REPORT SUBMISSION	1.23.19	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
BJB	MMC	BJB	AS SHOWN

SHEET TITLE: PLAN & PROFILE
ROUTE 1 CROSSING

PROJECT: SEAWALL SYSTEM CONCEPT DESIGN
WATERFRONT RESILIENCE STUDY
TOWN OF MACHIAS, MAINE

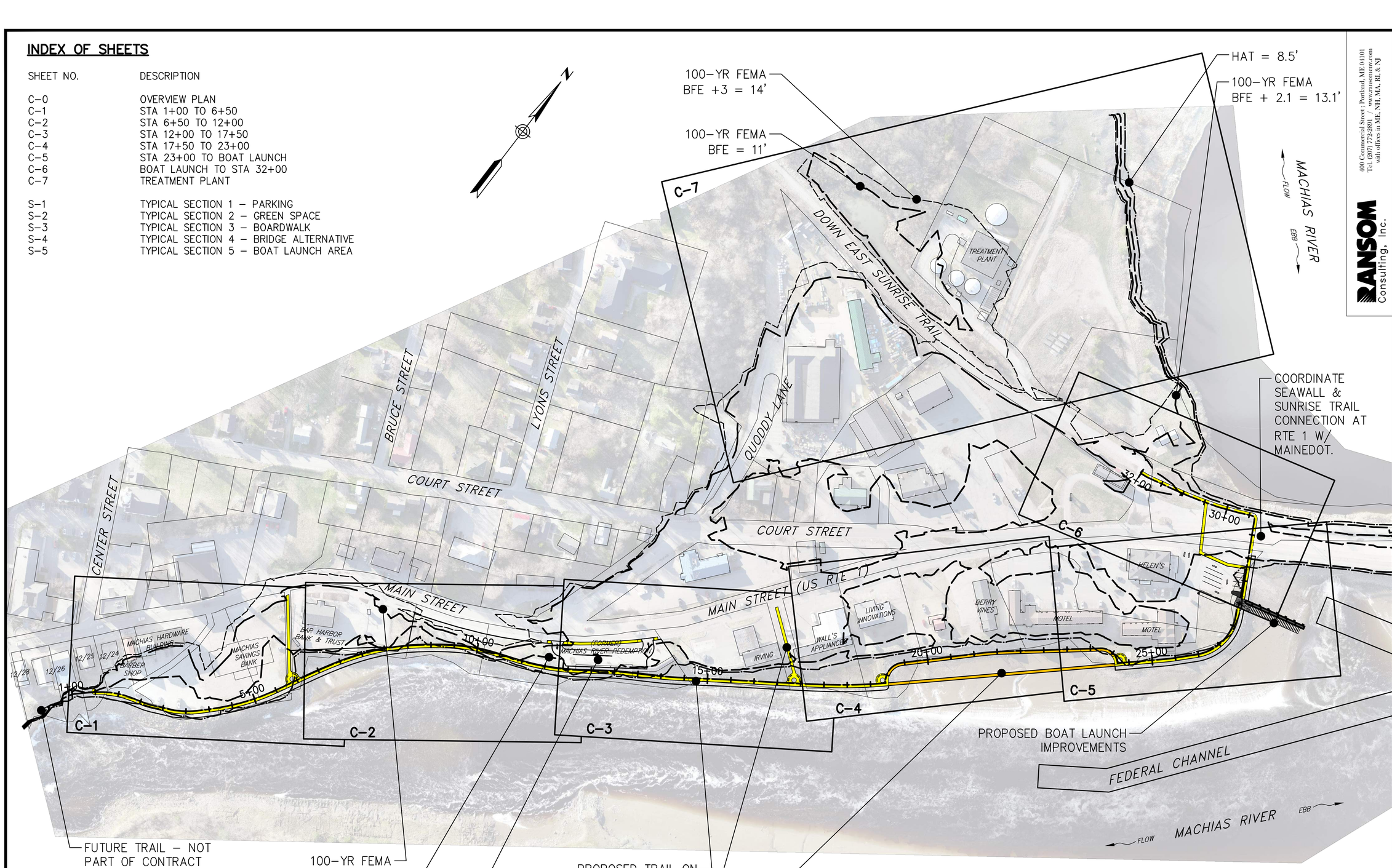
DATE
MAY 2018

CONTRACT NO.
17-59

SHEET NO. C-12 | REV. A

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
C-0	OVERVIEW PLAN
C-1	STA 1+00 TO 6+50
C-2	STA 6+50 TO 12+00
C-3	STA 12+00 TO 17+50
C-4	STA 17+50 TO 23+00
C-5	STA 23+00 TO BOAT LAUNCH
C-6	BOAT LAUNCH TO STA 32+00
C-7	TREATMENT PLANT
S-1	TYPICAL SECTION 1 – PARKING
S-2	TYPICAL SECTION 2 – GREEN SPACE
S-3	TYPICAL SECTION 3 – BOARDWALK
S-4	TYPICAL SECTION 4 – BRIDGE ALTERNATIVE
S-5	TYPICAL SECTION 5 – BOAT LAUNCH AREA



NOT FOR CONSTRUCTION

PRELIMINARY FOR REVIEW ONLY

NOTES:
1. CURRENT BASE FLOOD LIMIT SHOWN WILL BE REPOSITIONED SEAWARD OF THE NEW SEAWALL FOLLOWING CONSTRUCTION.

0 50 100 150 300

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NO.	DATE	INT.
A	2021 0908	BJB
PROGRESS SET SUBMISSION		

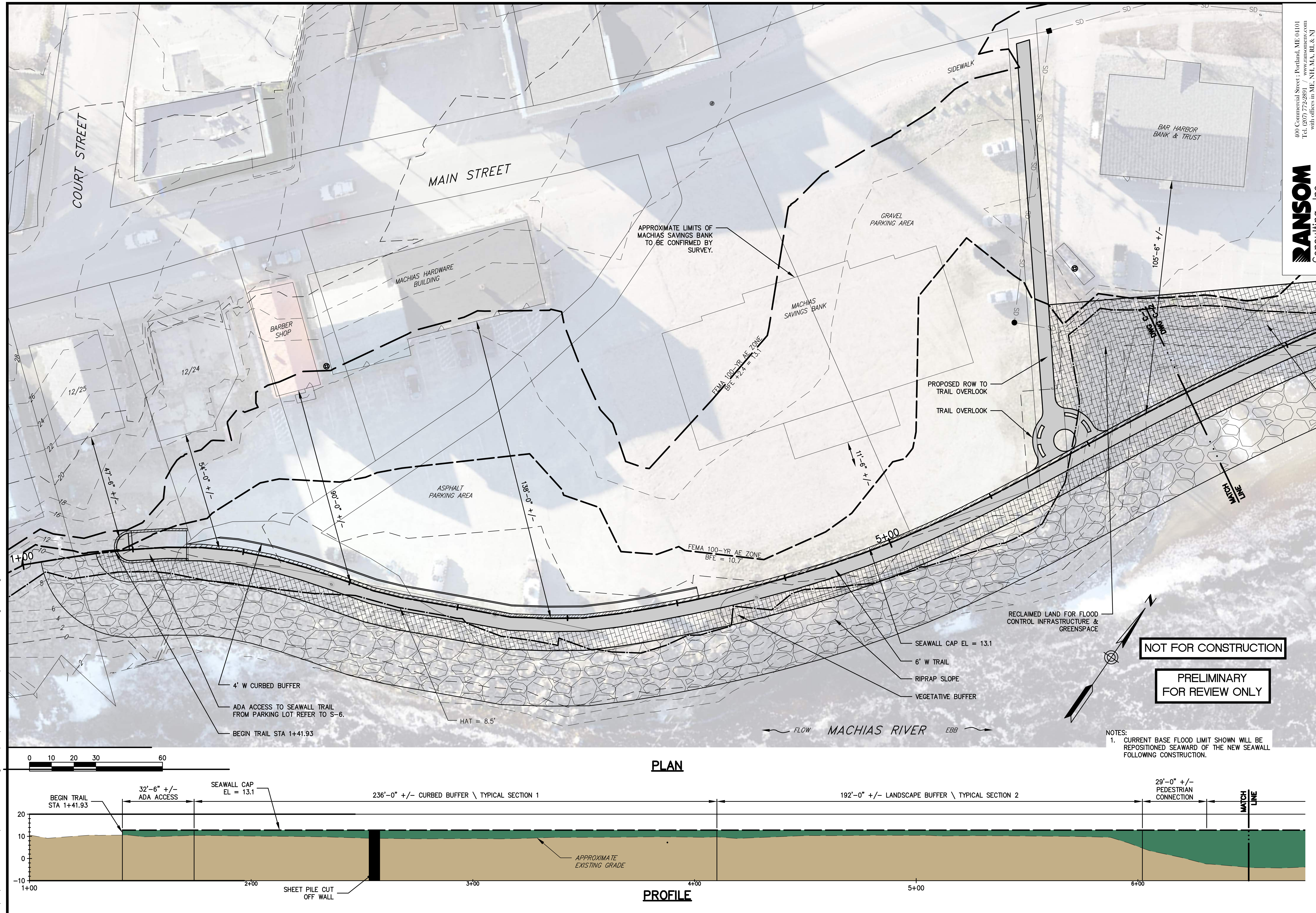
DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: OVERVIEW PLAN

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE SEPTEMBER 2021
CONTRACT NO. 20-14
SHEET NO. C-0
REV. A

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg



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A	PROGRESS SET	2021 0908	BJB

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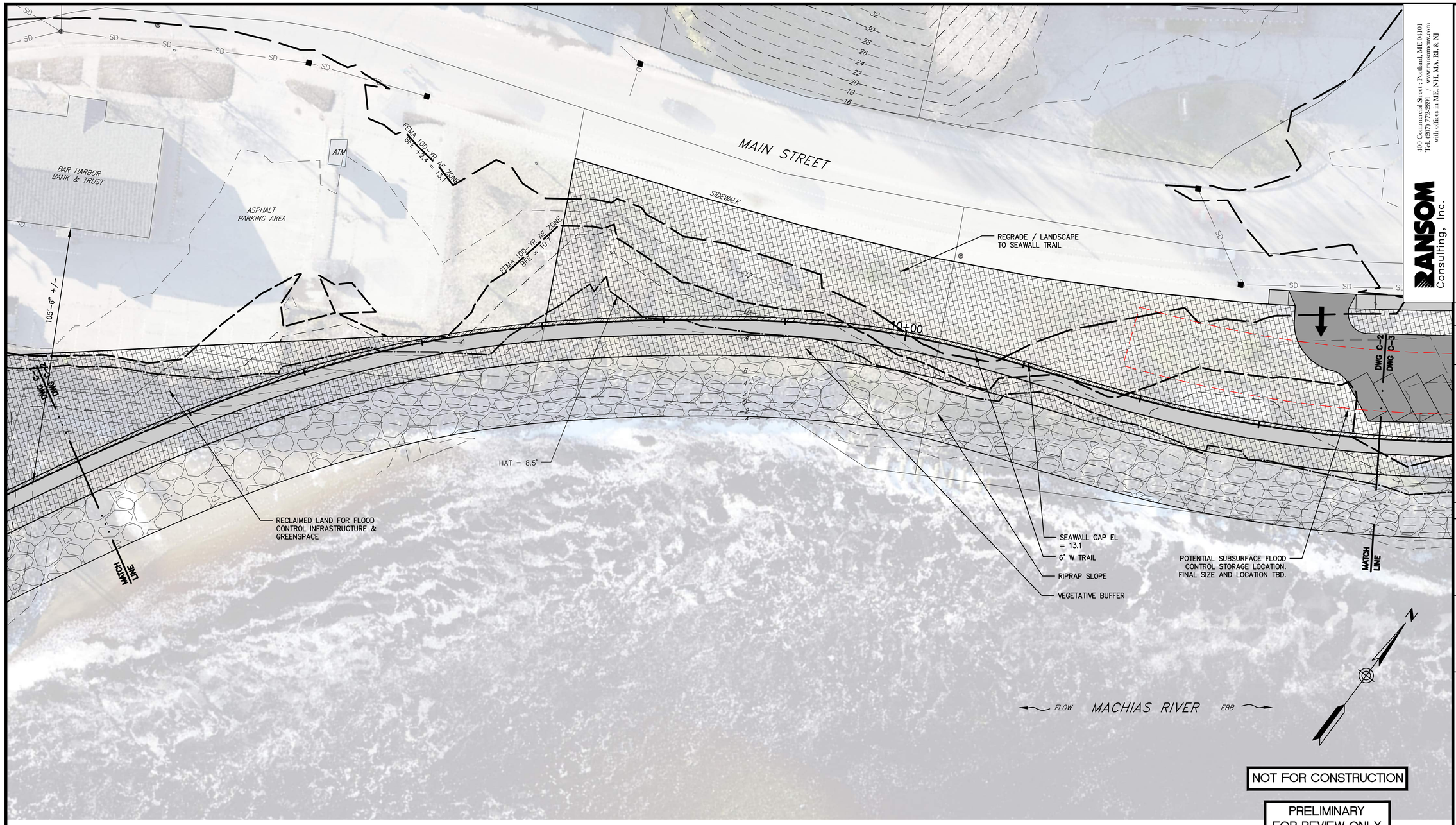
SCALE: AS SHOWN

SHEET TITLE: STA 1+00 TO 6+50

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE: SEPTEMBER 2021
CONTRACT NO. 20-14
SHEET NO. C-1
REV. A



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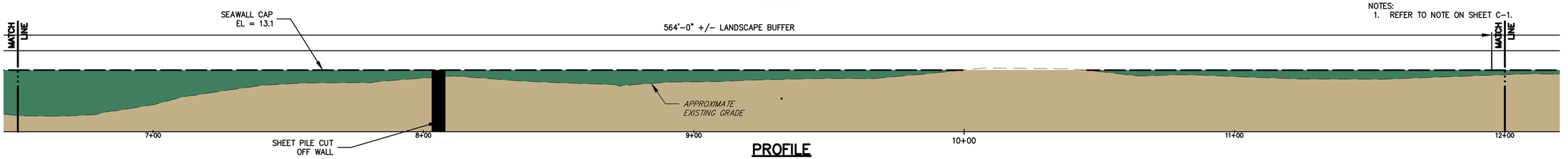
0 10 20 30 60

PLAN

NOTES:
1. REFER TO NOTE ON SHEET C-1.



PROFILE

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DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: STA 6+50 TO 12+00

PROJECT: MACHIAS PDM SEAWALL / TRAIL
TOWN OF MACHIAS
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. C-2 | REV. A

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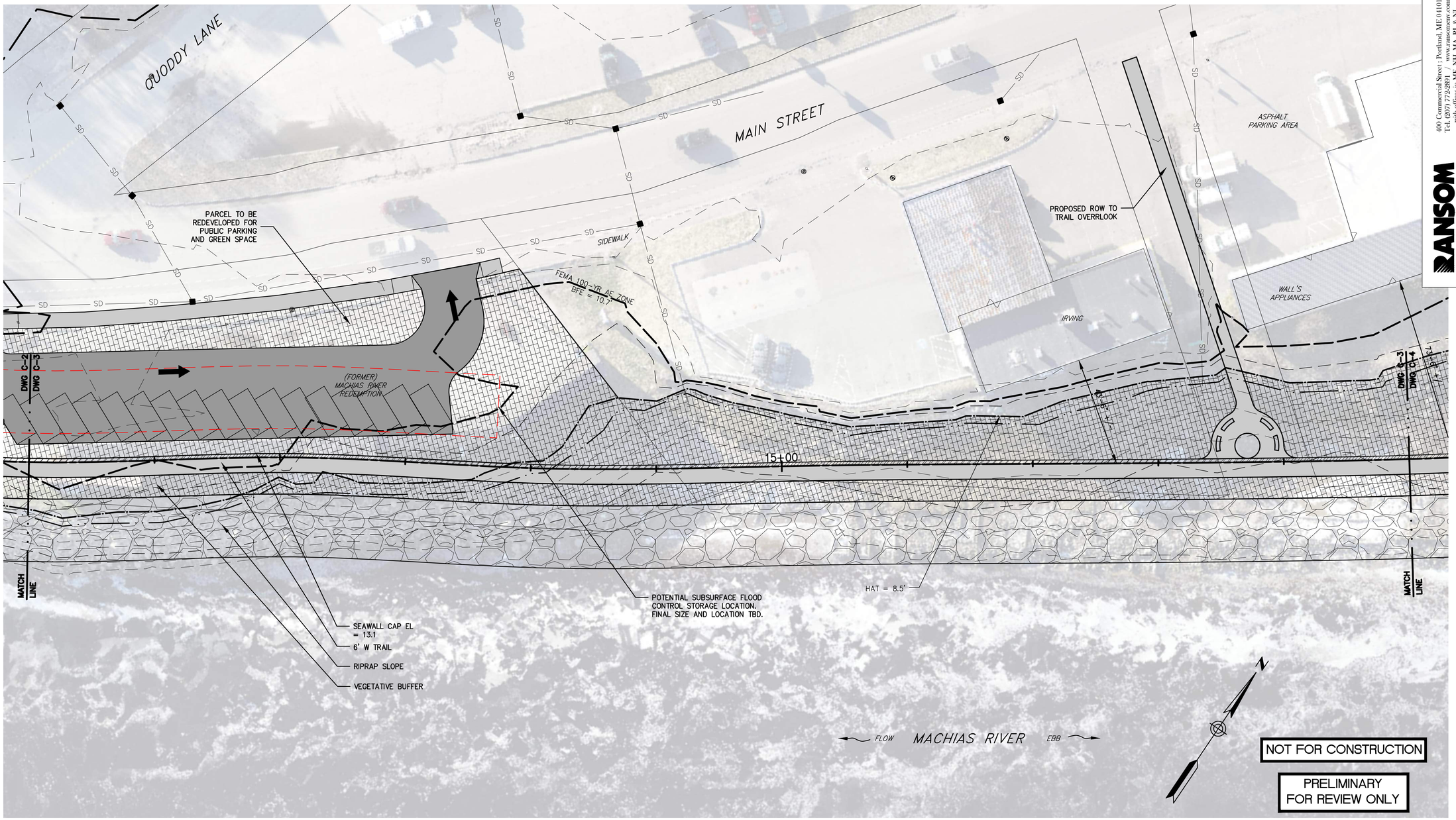
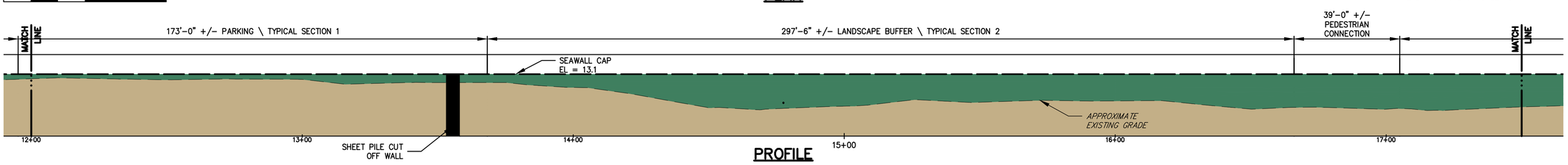


0 10 20 30 60

PLAN

NOTES:
1. REFER TO NOTE ON SHEET C-1.



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SUBMISSION

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CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: STA 12+00 TO 17+50

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. C-3 | REV. A

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MAIN STREET

SIDEWALK

ASPHALT PARKING AREA

LIVING INNOVATIONS

GRAVEL PARKING AREA

DECK

BERRY VINES

MOTEL

WALL'S APPLIANCES

TRAIL OVERLOOK

102'-0" +/-

60'-0" +/-

36'-0" +/-

54'-0" +/-

73'-6" +/-

DWG C-3
DWG C-4

FEMA 100-YR AE ZONE
BFE = 10.7'

SD

20+00

HAT = 8.5'

MATCH LINE

RECLAIMED LAND FOR FLOOD CONTROL INFRASTRUCTURE & GREENSPACE.

SEAWALL CAP EL = 13.1

6' W BOARDWALK

RIPRAP SLOPE

BRIDGE ALTERNATE

NOT FOR CONSTRUCTION

PRELIMINARY FOR REVIEW ONLY

0 10 20 30 60

PLAN

157'-6" +/- LANDSCAPE BUFFER \ TYPICAL SECTION 2

38'-0" +/- PEDESTRIAN OVERLOOK

507'-0" +/- BOARDWALK \ TYPICAL SECTION 3
BRIDGE ALTERNATE \ TYPICAL SECTION 4

SEAWALL CAP EL = 13.1

APPROXIMATE EXISTING GRADE

SHEET PILE CUT OFF WALL

18+00 19+00 20+00 21+00 22+00 23+00

PROFILE

NOTES:
1. REFER TO NOTE ON SHEET C-1.

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CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: STA 17+00 TO 23+00

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. C-4
REV. A

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PEDESTRIAN CROSSWALK

RTE 1 ALIGNMENT TO MATCH SEAWALL ALIGNMENT EL =13.1. COORDINATE WITH MAINEDOT

GRAVEL AREA

HELEN'S

MAIN STREET (RTE 1)

ASPHALT PARKING AREA

BOAT LAUNCH & PARKING IMPROVEMENTS

MOTEL

FEMA 100-YR AE ZONE BFE = 10'

172'-6" +/-

LAWN

BOAT LAUNCH FOOTPRINT

MOTEL

FEDERAL CHANNEL

DWG C-2

DWG C-1

53'-0" +/-

39'-0" +/-

TRAIL OVERLOOK

BOAT LAUNCH FLOATS

25+00

MATCH LINE

SEAWALL CAP EL = 13.1

6' W TRAIL

RIPRAP SLOPE

VEGETATIVE BUFFER

HAT = 8.5'

FLOW MACHIAS RIVER EBB

NOT FOR CONSTRUCTION

PRELIMINARY FOR REVIEW ONLY

0 10 20 30 60

PLAN

NOTES:
1. REFER TO NOTE ON SHEET C-1.

MATCH LINE

37'-6" +/- PEDESTRIAN OVERLOOK

297'-0" +/- LANDSCAPE BUFFER \ TYPICAL SECTION 2

112'-6" +/- BOAT LAUNCH IMPROVEMENTS W/ MAINEDOT INPUT\ TYPICAL SECTION 5

RTE 1

SEAWALL CAP EL = 13.1

APPROXIMATE EXISTING GRADE

23+00 24+00 25+00 26+00 27+00 28+00

SHEET PILE CUT OFF WALL

PROFILE

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg

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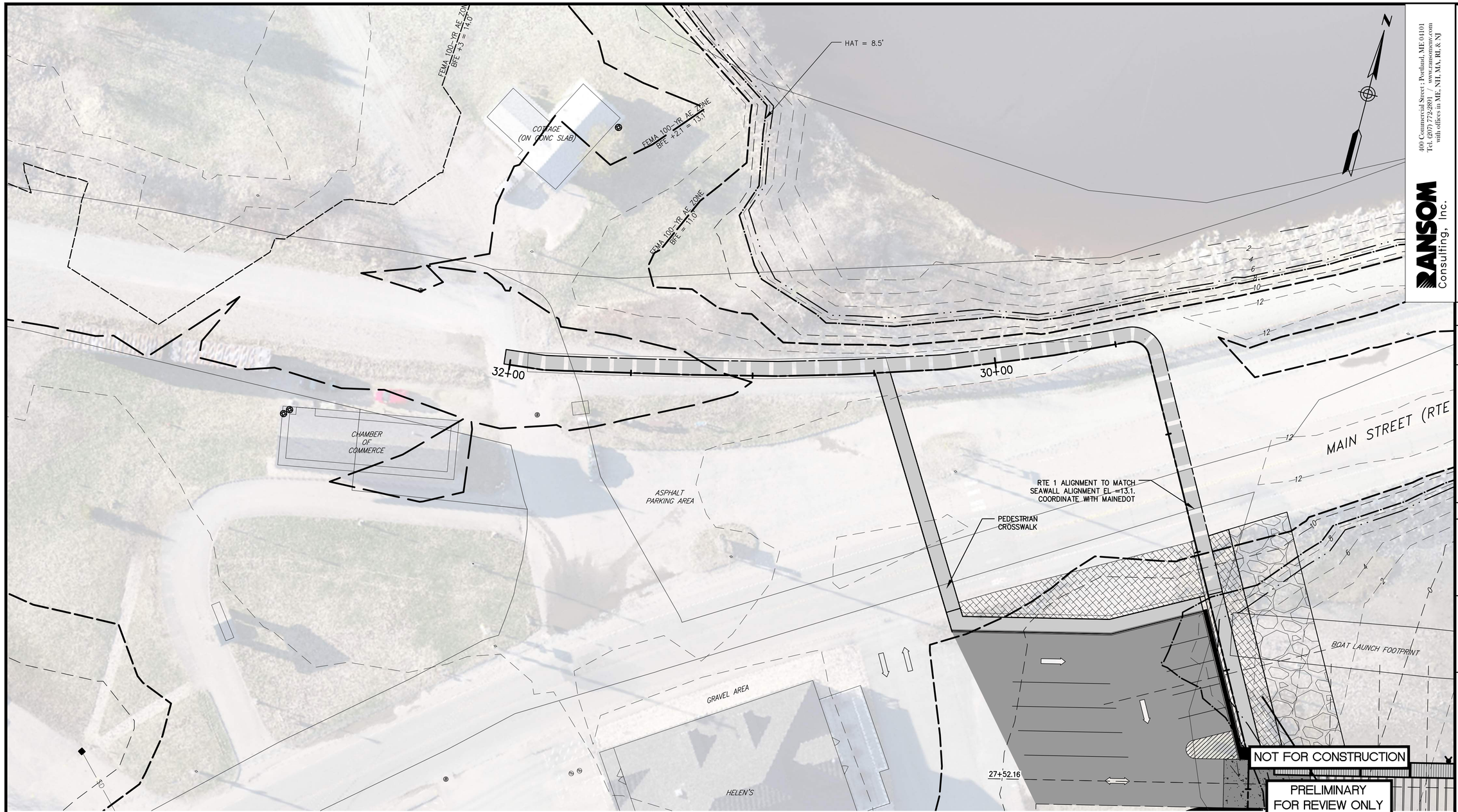
SCALE: AS SHOWN

SHEET TITLE: STA 23+00 TO BOAT LAUNCH

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE SEPTEMBER 2021
CONTRACT NO. 20-14

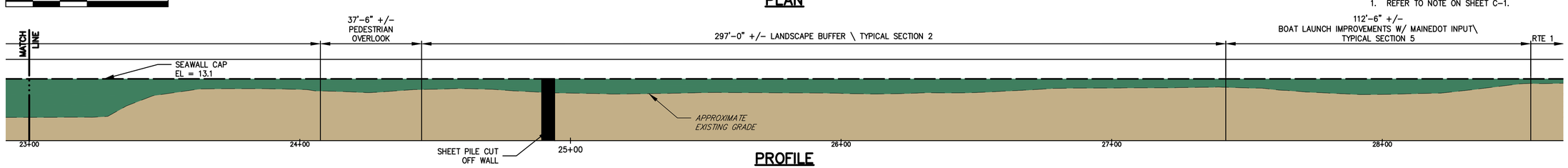
SHEET NO. C-5
REV. A



0 10 20 30 60

PLAN

NOTES:
1. REFER TO NOTE ON SHEET C-1.



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A	PROGRESS SET SUBMISSION 2021 0908	BJB

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: BOAT LAUNCH TO STA 32+00

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. C-6 | REV. A

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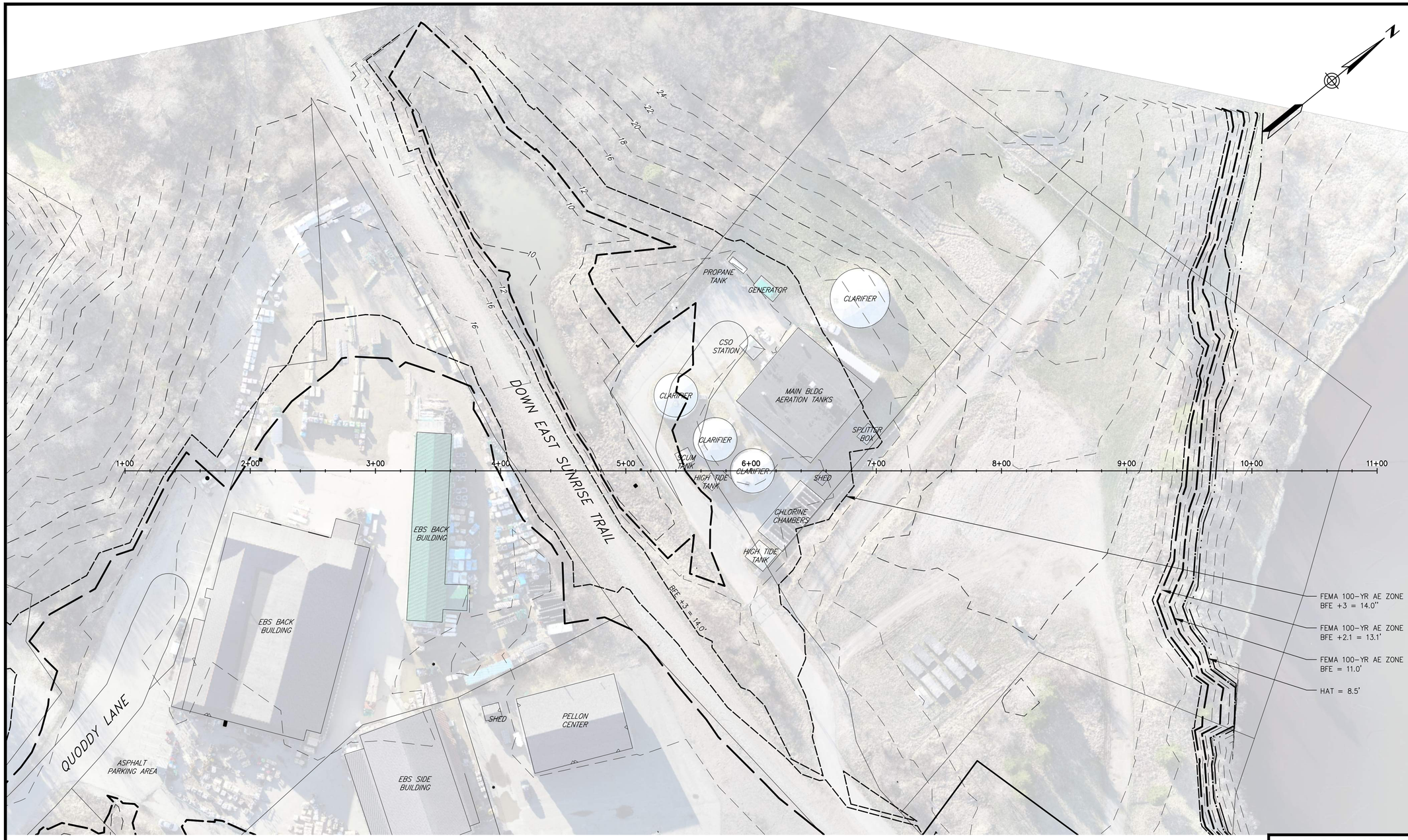
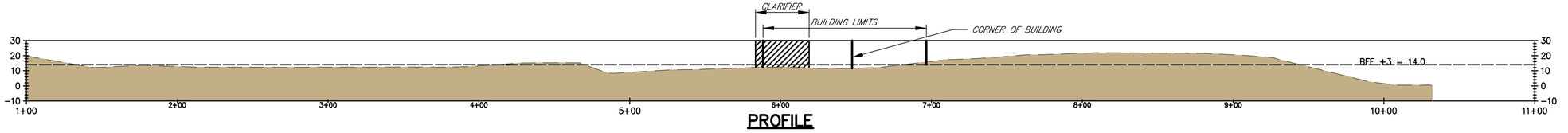


PLAN



PROFILE

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A	2021 0908	BJB
PROGRESS SET SUBMISSION		

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SCALE: AS SHOWN

SHEET TITLE: TREATMENT PLANT

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

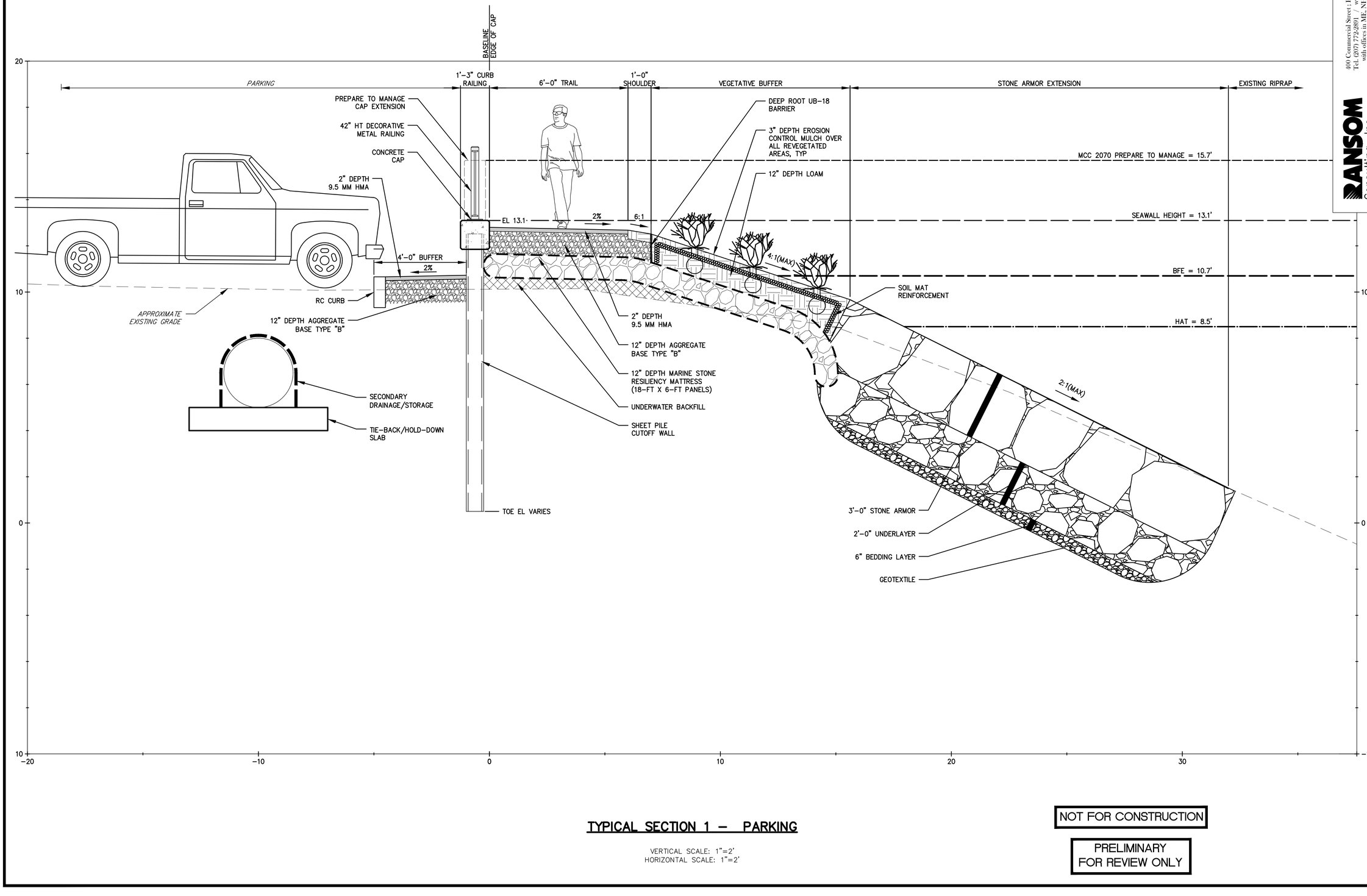
DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. C-7

REV. A

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg



TYPICAL SECTION 1 – PARKING

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

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SCALE: AS SHOWN

SHEET TITLE: TYPICAL SECTION 1 PARKING

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20–14

SHEET NO. S-1
REV. A

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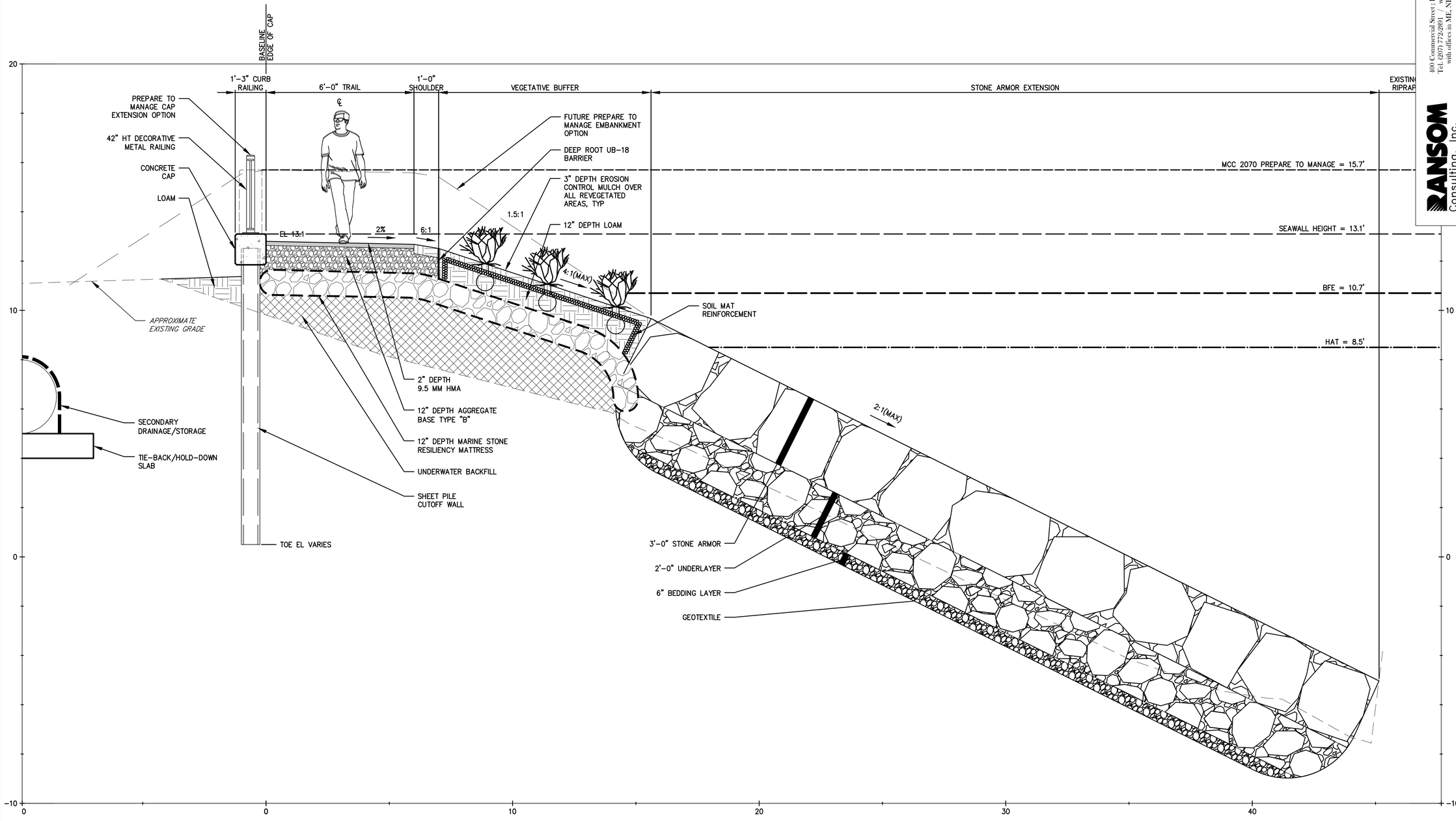

TYPICAL SECTION 2 – GREEN SPACE

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

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SCALE: AS SHOWN

SHEET TITLE: TYPICAL SECTION 2 GREEN SPACE

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20–14

SHEET NO. S-2
REV. A

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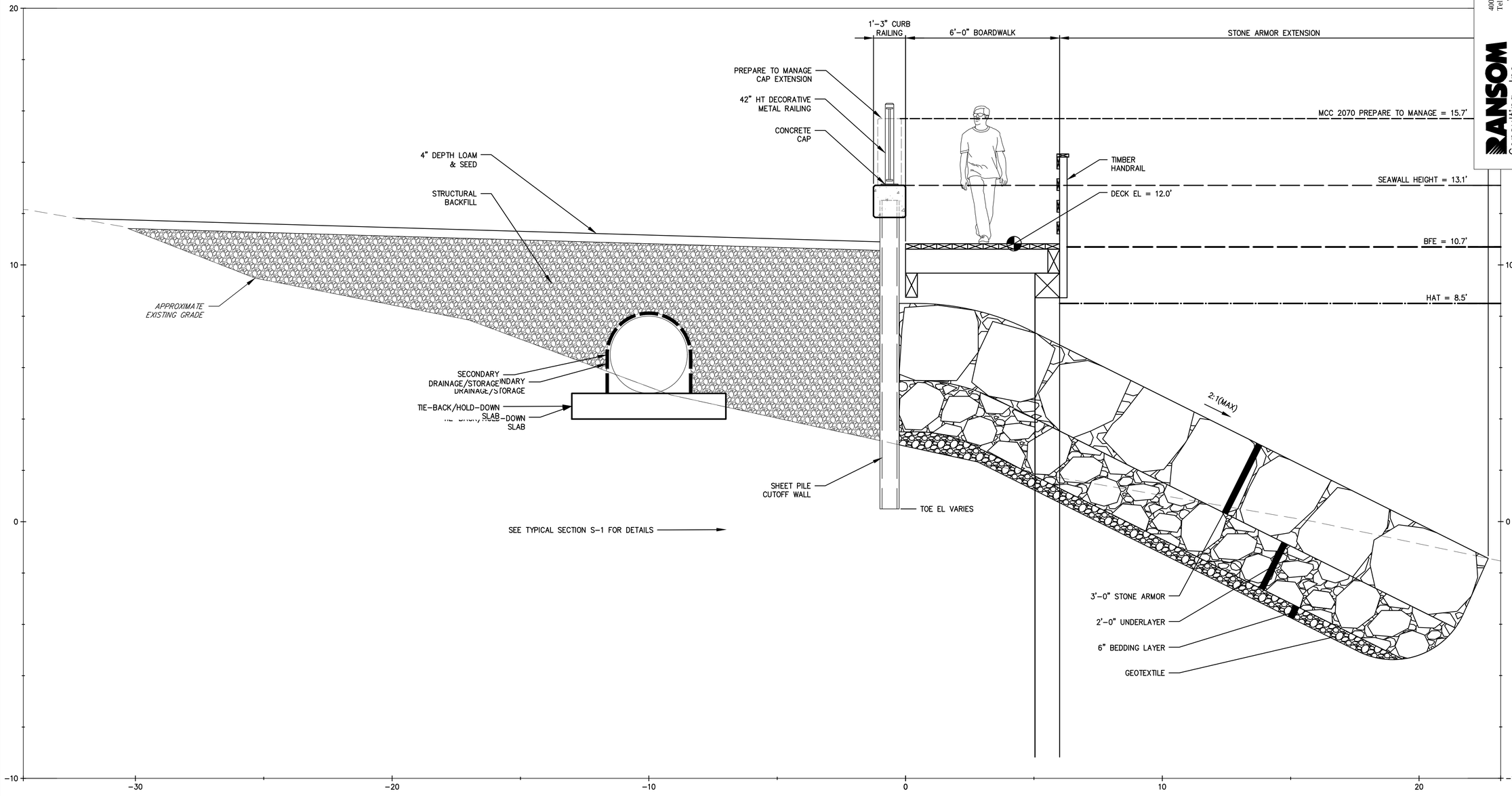

TYPICAL SECTION 3 – BOARDWALK

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg

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SCALE: AS SHOWN

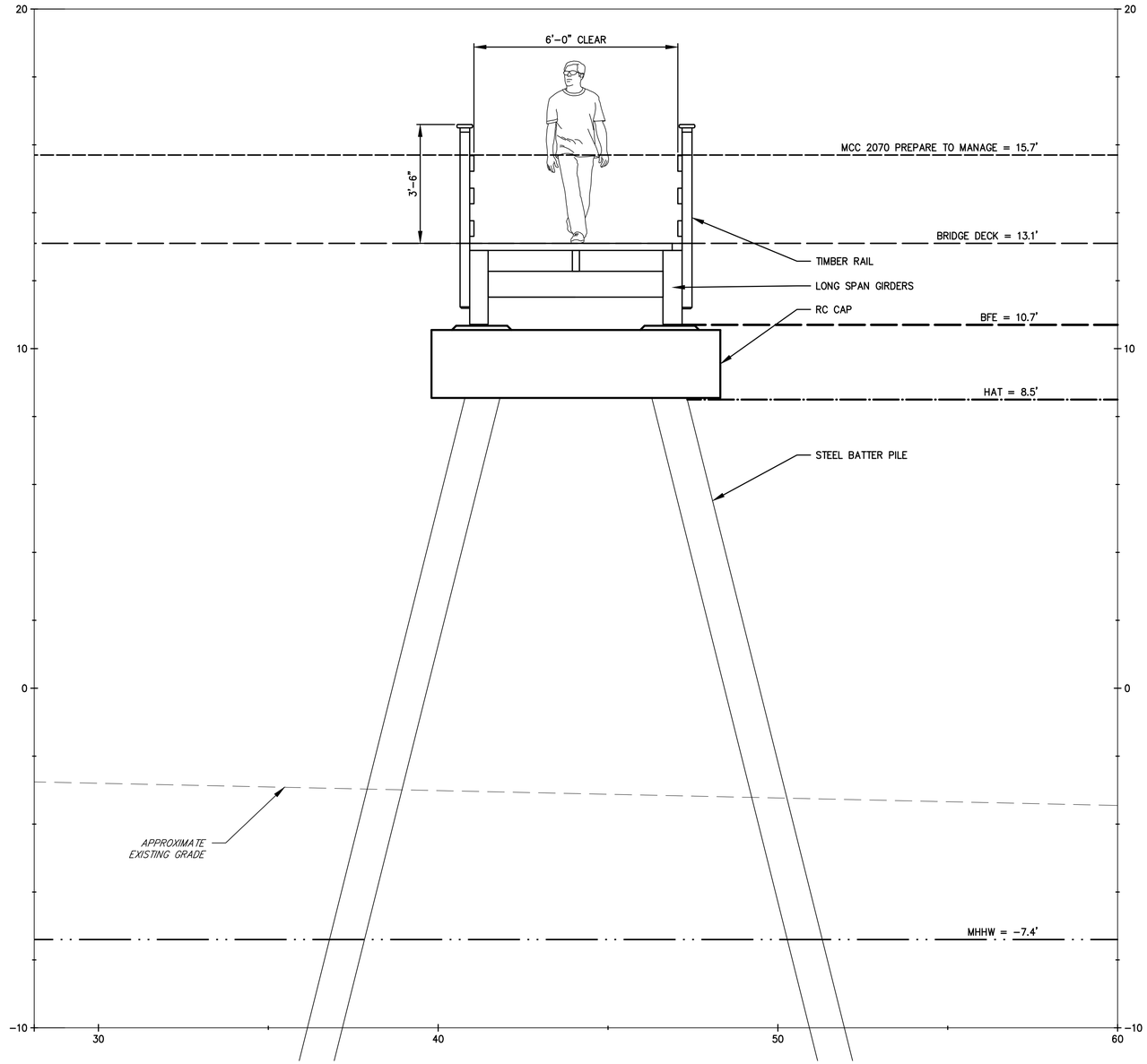
SHEET TITLE: TYPICAL SECTION 3 BOARDWALK

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. S-3
REV. A



TYPICAL SECTION 4 – BRIDGE ALTERNATIVE

VERTICAL SCALE: 1"=2'
HORIZONTAL SCALE: 1"=2'

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SCALE: AS SHOWN

SHEET TITLE: TYPICAL SECTION 4 BRIDGE ALTERNATIVE

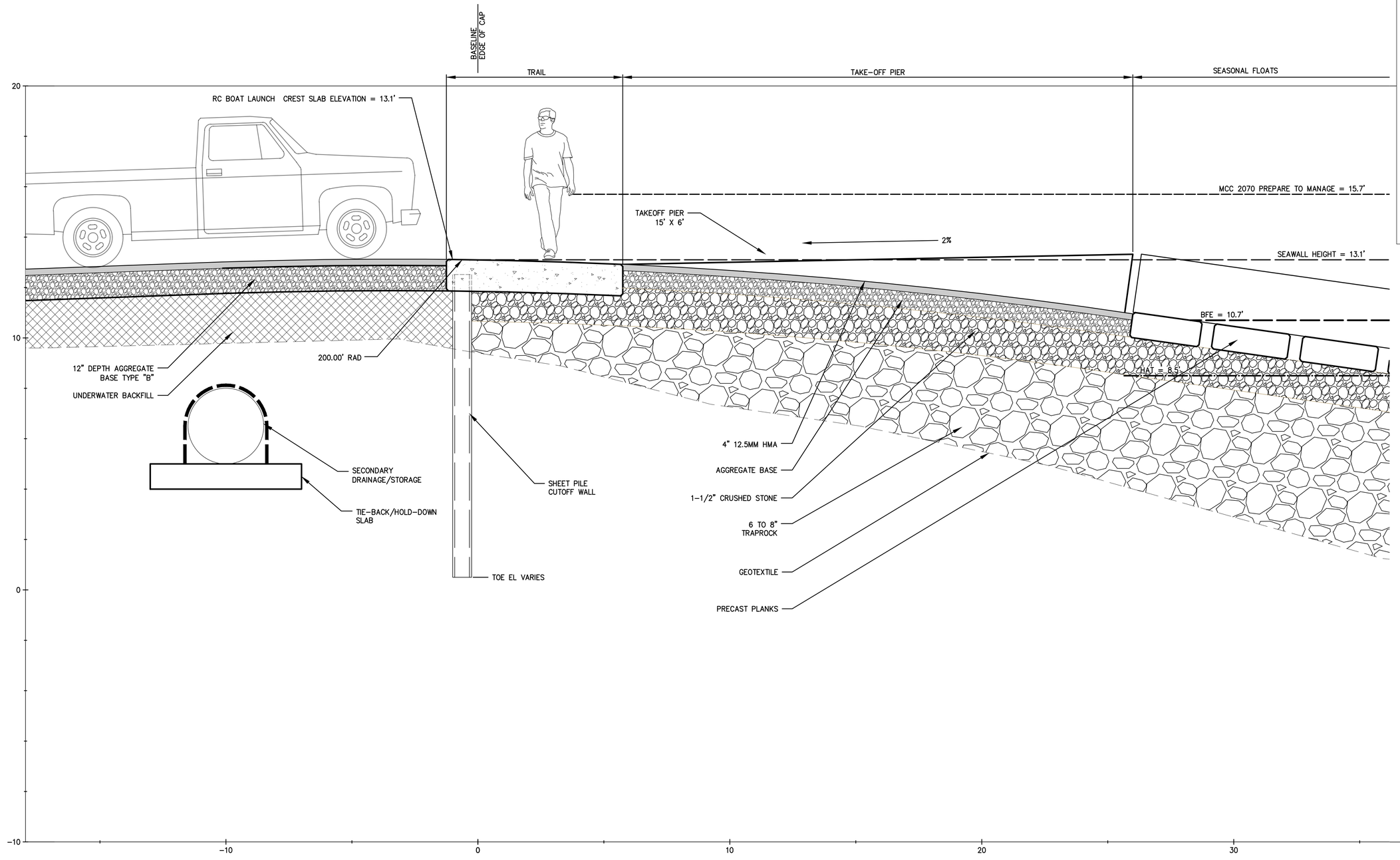
PROJECT: MACHIAS PDM SEAWALL / TRAIL
TOWN OF MACHIAS
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20–14

SHEET NO. S-4 | REV. A

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg



TYPICAL SECTION 5 – BOAT LAUNCH

VERTICAL SCALE: 1"=4'
HORIZONTAL SCALE: 1"=4'

x:\20\20-14 machias pre-disaster mitigation\cad\20-14_machias pre-disaster mitigation.dwg

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A	2021 0908	BJB
PROGRESS SET SUBMISSION		

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: TYPICAL SECTION 5 BOAT LAUNCH

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. S-5
REV. A

VIEW 1 LOOKING SOUTH – STA 3+75 +/–

NOT TO SCALE

NOT FOR CONSTRUCTION

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SCALE: AS SHOWN

SHEET TITLE: EXISTING CONDITIONS ILLUSTRATIVE RENDERING

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. F-1 | REV. A

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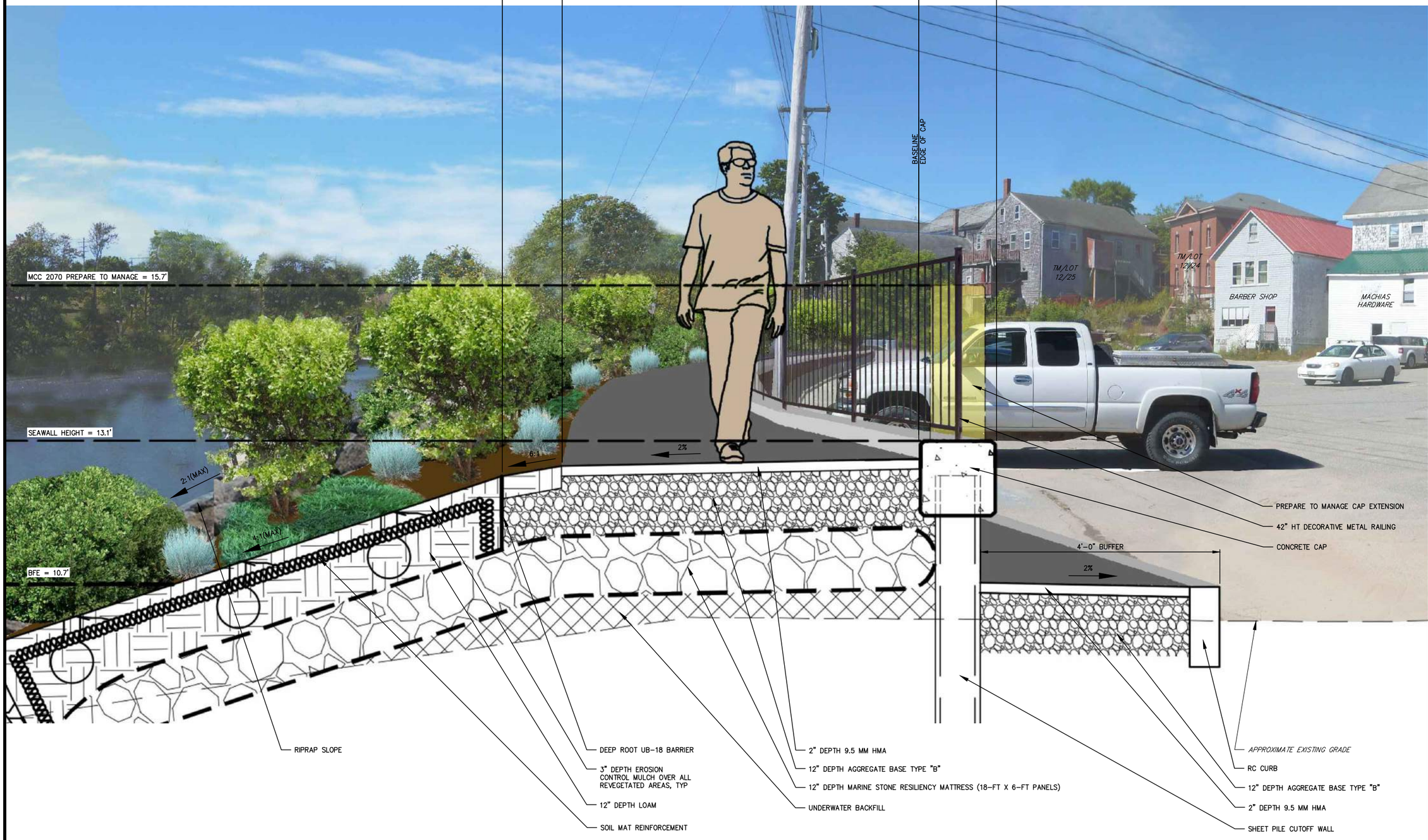

VIEW 1 LOOKING SOUTH – STA 3+75 +/-

NOT TO SCALE

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DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PROPOSED SEAWALL / TRAIL ILLUSTRATIVE RENDERING

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. F-2 | REV. A

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VIEW 2 LOOKING SOUTH – STA 23+50 +/–

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SCALE: AS SHOWN

SHEET TITLE: EXISTING CONDITIONS ILLUSTRATIVE RENDERING

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE
SEPTEMBER 2021

CONTRACT NO.
20-14

SHEET NO. F-3
REV. A

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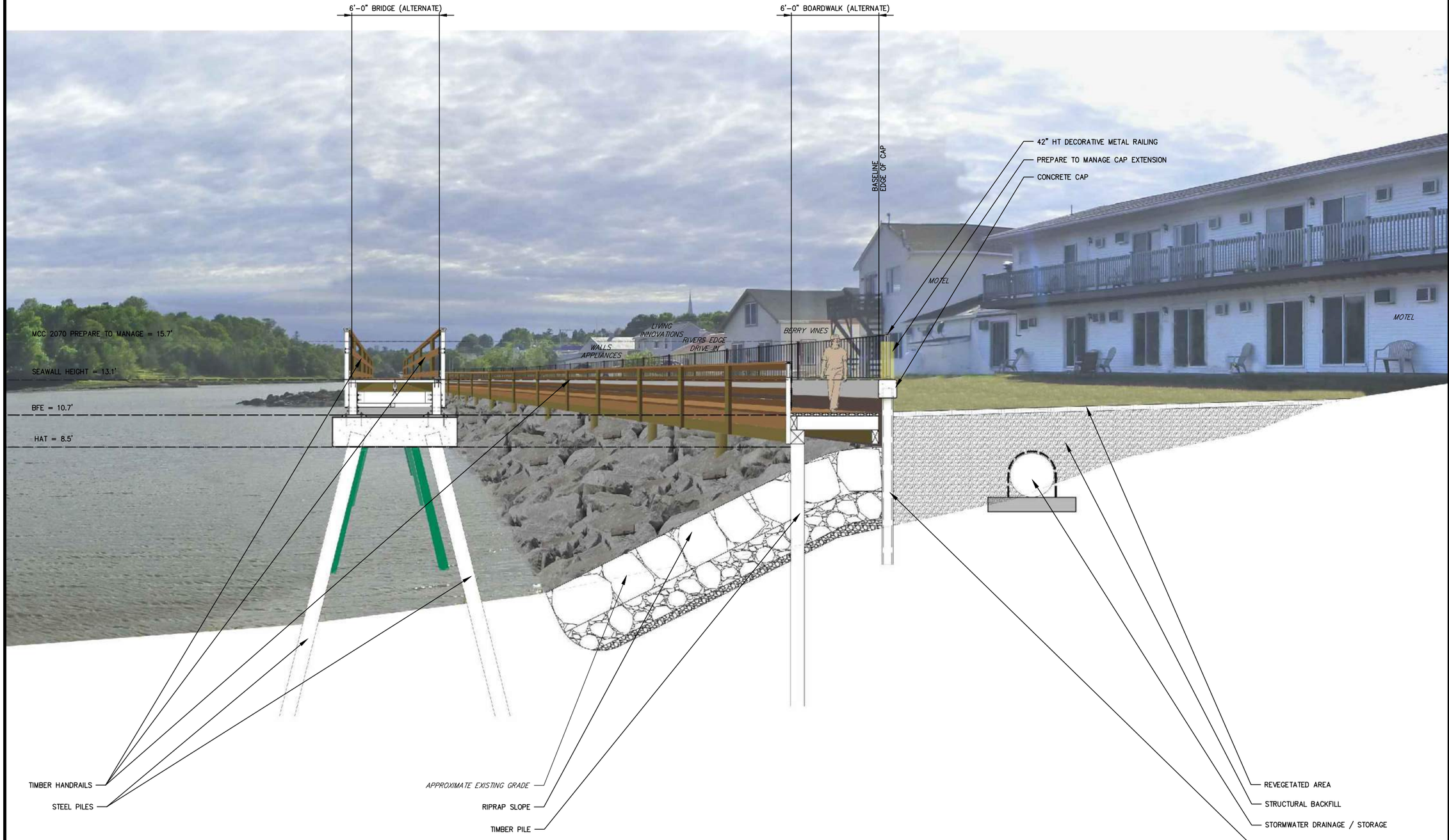

VIEW 2 LOOKING SOUTH – STA 23+50 +/–

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SHEET TITLE: PROPOSED SEAWALL / TRAIL ILLUSTRATIVE RENDERING

PROJECT: TOWN OF MACHIAS
MACHIAS PDM SEAWALL / TRAIL
MACHIAS, MAINE

DATE SEPTEMBER 2021

CONTRACT NO. 20-14

SHEET NO. F-4

REV. A

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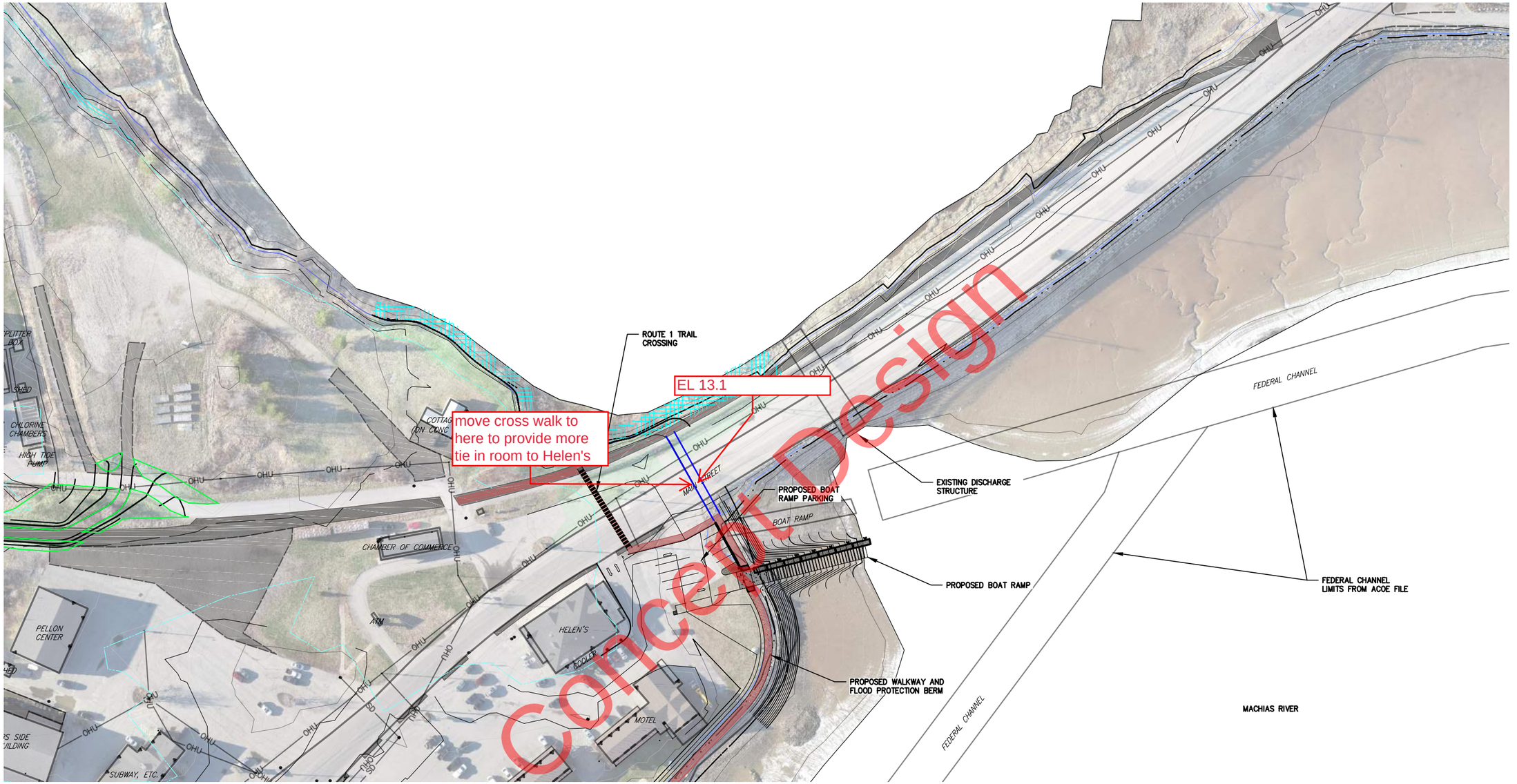

SITE PLAN

0 30 60 90 180

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SHEET TITLE: SITE PLAN

PROJECT: MACHIAS BOAT RAMP REPLACEMENT
TOWN OF MACHIAS
MACHIAS, MAINE

DATE
MAY 2021

CONTRACT NO.
20-14-2

SHEET NO. C-1
REV. A

MIN 13.1' COORDINATE WITH DOT

CHNT

SIDEWALK

BFE = ELEVATION 10.7'

(5) 10-FT X 20-FT PARKING

ASPHALT PARKING AREA

20'-0"

24'-0"

RETAINING WALL

(3) 10-FT X 40-FT TRAILER PARKING

T1

T2

T3

CB

10'-0"

MAKE READY

10.4 TOP OF CATCH BASIN

EXISTING PARKING LIMITS

EXISTING LAWN AREA

RAMP CREST ELEVATION = 13.1'

5X5 PEDISTAL

TAKEOFF PIER 15'X6'

WALKWAY BERM

BOAT RAMP

MHHW = ELEVATION 7.4'

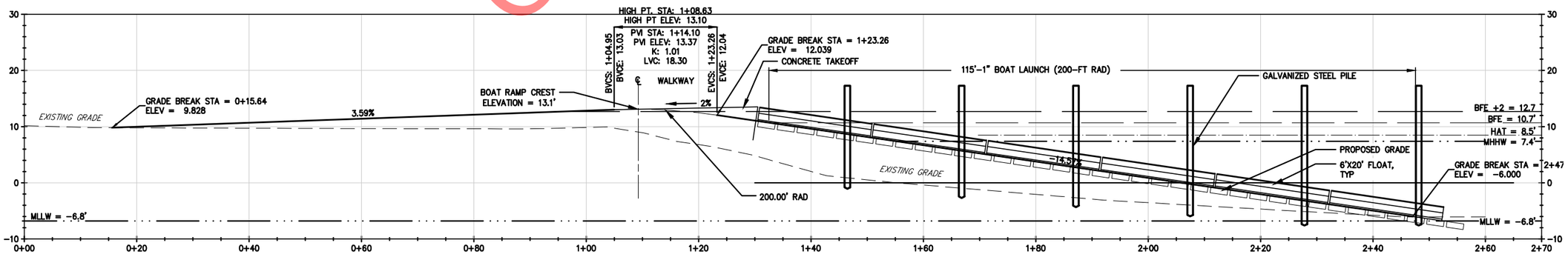
HAT = ELEVATION 8.5'

FLOATS 20'X6'

PROPOSED BOAT RAMP

0+00 0+20 0+40 0+60 0+80 1+00 1+20 1+40 1+60 1+80 2+00 2+20 2+40 2+60

BOAT LAUNCH PLAN



BOAT LAUNCH PROFILE

0 5 10 15 30

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NO.	DATE	INT.
A	2021 061	BJB
	PROGRESS SET SUBMISSION	

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SCALE: ###

SHEET TITLE: PLAN & PROFILE

PROJECT: TOWN OF MACHIAS
MACHIAS BOAT RAMP REPLACEMENT
MACHIAS, MAINE

DATE
MAY 2021

CONTRACT NO.
20-14-2

SHEET NO. S-1 REV. A

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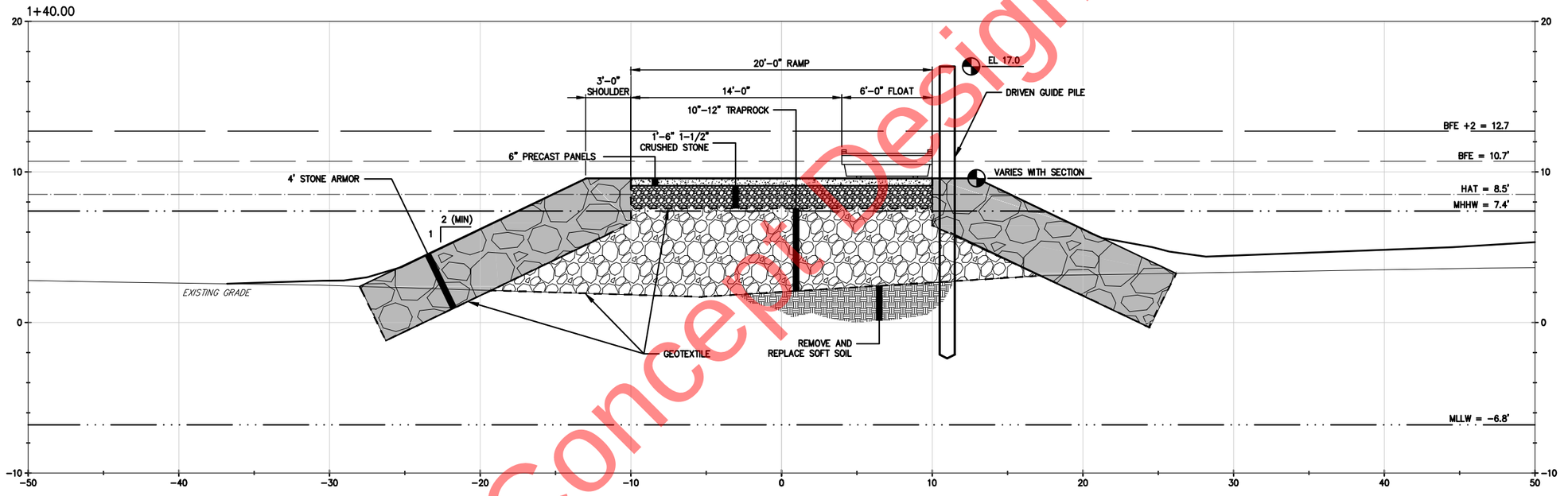

TYPICAL SECTION

0 2 4 6 8 16

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	PROGRESS SET SUBMISSION	

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SHEET TITLE: TYPICAL SECTION

PROJECT: MACHIAS BOAT RAMP REPLACEMENT
TOWN OF MACHIAS
MACHIAS, MAINE

DATE
MAY 2021

CONTRACT NO.
20-14-2

SHEET NO. S-2

REV. A

PRE-DISASTER
MITIGATION GRANT
REQUIREMENTS

MAINE CLIMATE
COUNCIL SEA LEVEL
RISE REQUIREMENTS

TOP OF CURB ELEVATION = 13.1

8'-0" WALKWAY

FUTURE 'PREPARE TO MANAGE' SLOPE AND WALKWAY.

VEGETATED SLOPE/BUFFER

1'-8"
COBBLE
6" CURB

3%

2%

4
1

EL 15.7 (BFE+5)
2070 PREPARE TO MANAGE

EL 13.1 (BFE+2.4)
2070 COMMIT TO MANAGE

EL 12.7 (BFE+2')

EL 12.2 (BFE+1.5)
2050 COMMIT TO MANAGE

BFE=10.7

BFE=10.7

2
1

STONE
REVETMENT

TOP OF CURB ELEVATION = 13.1

MUNICIPAL BOAT RAMP PARKING

0 2 4 6 12

x:\20\20-14 machias pre-disaster mitigation\20-14-2 machias boat ramp replacement\cad\bjb\20-14-2 machias boat ramp.dwg

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	PROGRESS SET SUBMISSION	

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SCALE: ####

SHEET TITLE: TYPICAL SECTION - BHBT

PROJECT: MACHIAS BOAT RAMP REPLACEMENT
TOWN OF MACHIAS
MACHIAS, MAINE

DATE
MAY 2021

CONTRACT NO.
20-14-2

SHEET NO. S-3

REV. A

Schoppee Marsh

Restoring Schoppee Salt Marsh:
Increasing the Coastal Resilience of Machias, Maine.

Coastal Community Context

Risk to coastal community: Much of the historic downtown district of the Town of Machias, the county seat of Washington County, is located below or only slightly above the Base Flood Elevation (BFE) as established by FEMA. This area of the town is already periodically flooded during extreme high tides and/or storms. The town conducted a Waterfront Resilience Study in 2017 to investigate and define the risk of flood damage to downtown Machias due to anticipated sea-level rise (Machias 2017). The study determined that at BFE + 2 feet 12 buildings would be inundated causing an economic impact of just under $8 million. At BFE + 4 feet, 22 buildings would be inundated at a cost of almost $17 million. The town's wastewater treatment plant is already forced to pump water during high tides under current conditions and would be inundated under the BFE + 6 feet scenario. On April 9th 2020, a spring tide inundated downtown Machias and caused an overflow event at the treatment plant. The wastewater that seeped into the nearby estuary caused valuable shellfish grounds to be closed. For context, the population of Machias is about 2,300.

The study developed a conceptual engineering design for a flood protection system. Primary protection would come from a seawall; secondary protection from a living shoreline. The study recognized that hardened structures such as seawalls reflect wave energy and may exacerbate erosion, destroy intertidal habitat, and alter sediment transport patterns. The study specified the need to include living shoreline in the seawall design and to develop other living shoreline projects in Machias Bay to absorb floodwaters and storm surges. The subject of this application, 50 acres of Schoppee Marsh were cut off from saltwater tidal flow by a railroad built in 1906.

The proposed project would restore Schoppee Marsh, adding to Machias' living shoreline, protecting the historic downtown district as well as restoring salt marsh habitat and reopening the marsh to fish passage. The project is consistent with the NOAA and the State of Maine's interests in developing living shorelines to reduce coastal flooding (NOAA 2015, Maine 2017). It is also consistent with the Natural Resource Resilience Program's intent to connect conservation with resiliency actions.

Efforts to prepare community: The Downeast Salmon Federation (DSF) has laid a solid foundation on which to launch this project. DSF has engaged and has the support of the town's civic leaders and civic organizations, including the Machias Downtown Revitalization Committee, which will host several public meetings over the course of the project, the Sunrise County Economic Council, and the Washington County Council of Governments. The project has widespread support within the community and we have many offers of volunteer help.

DSF has also worked to build support for the project in the relevant state and federal agencies, including the US Fish and Wildlife Service (USFWS), which provided staff to do the initial hydrological survey of the marsh; the Maine Natural Areas Program in the Department of Agriculture, Conservation, and Forestry (DACF); the Maine Coastal Program, a division of the Maine Department of Marine Resources; the Maine Geological Survey; the Department of Environmental Protection; the Maine Department of Transportation (DOT), which owns the railroad bed; and the US Army Corps of Engineers, which will be one of the key permitting agencies.

We have also solicited and received the support of several local and regional Non-Governmental Organizations (NGOs) all of which are involved in land and habitat restoration and conservation. These include the Maine Coast Heritage Trust, The Nature Conservancy, the Downeast Fisheries Partnership, and the Sipayik Environmental Department of the Passamaquoddy Tribe.

Science teachers at all of the area schools have been briefed and invited to participate in the project with their students. Several key professors at the University of Maine at Machias (UMM), including Dr. Tora Johnson, who currently chairs the Science division at UMM and was a leader in the Waterfront Resilience Study as well as the predictive modeling for Machias flooding and Machias Bay living shoreline analyses will participate in the data collection and post-completion monitoring of the project.

Action leading up to proposed project: All preliminary work required to successfully initiate the proposed project has been completed or is in process:

- Permission has been secured from the landowner to work in the marsh and from DOT and DACF to work on the rail bed;
- An initial hydrological survey was completed by DSF with USFWS staff;
- Secondary deployment of surface water elevation data loggers is underway;
- Baseline data collection protocols have been designed and data collection has begun;
- Engineering firms have been informally consulted to determine the necessary scope and approximate cost of a feasibility study. The study will be necessary before the engineering design work can begin;
- Research to determine required project permitting has been completed;
- Outreach to the community to ensure public support for the project has been initiated and will continue throughout the project;
- Schools and summer programs have been invited to participate in the data collection and restoration work (6 have agreed);
- Several professors at the University of Maine at Machias have agreed to engage their students in research projects related to the project;
- Fundraising to support all work completed to date has been accomplished;
- Fundraising for subsequent work is in progress.

Predictive modeling or threat assessments: Predictive modeling of the threats facing Machias due to sea-level rise in coming decades was undertaken in the Waterfront Resiliency Study (Machias 2017). Based on NOAA's low, medium, high sea-level predictions for the Cutler Tidal Station at the mouth of Machias Bay, downtown Machias would suffer the flooding indicated in the following maps:

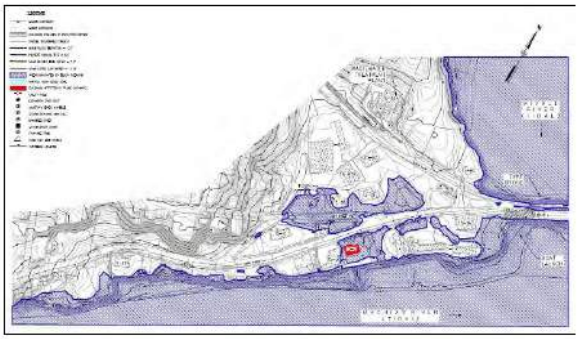

Figure 5 – Effective Base Flood Elevation;

Figure 7 – Base Flood Elevation plus 4-FT

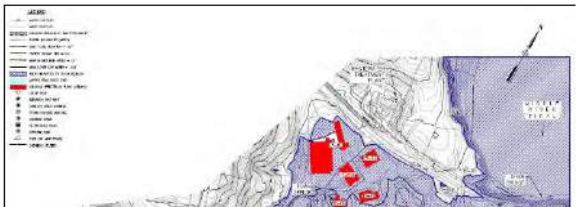

Figure 1. Predictive modeling for downtown Machias at Base Flood Elevation (BFE) plus 2, 4, and 6-foot sea-level rise (SLR) scenarios was completed by Dr. Tora Johnson at the University of Maine at Machias GIS lab. Machias currently floods during King Tide storm events as evident in Figure 5 above left. Legend: Blue is flood zone, red are structures.

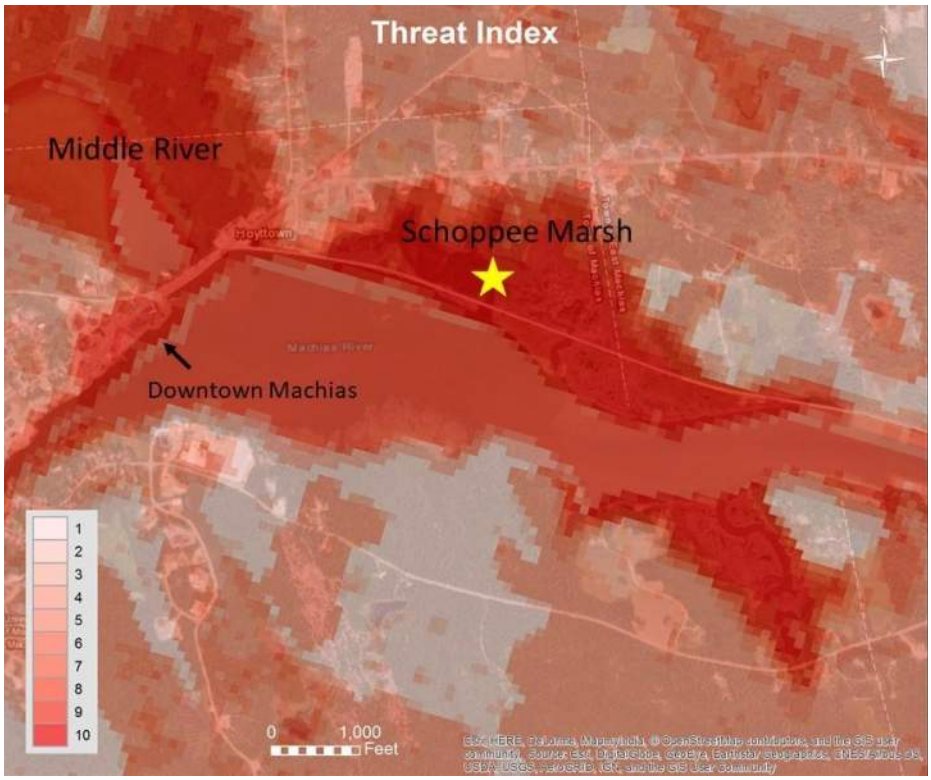

Figure 2: The NFWF Coastal Resilience Evaluation and Siting Tool (CREST) Community Threat Index ranks Downtown Machias and Schoppee Marsh at threat level #10.

Activities:

All of the activities detailed below must be successfully completed for this project to achieve its outcomes.

- **Adaptive Management Strategies:** DSF intends to use an adaptive management strategy to restore marsh surface elevation, hydrology, and vegetation. The strategy will be informed by making experimental changes, observing the results, and adopting methods that support the recolonization of halophytic vegetation. Experimental changes include: 1) Propping open the tide gate that blocks tidal flow into the western half of the mash to increase drainage and tidally deposited sediment; 2) Conducting experimental planting of *Spartina alterniflora* to help re-establish vegetation in the subsided extent of the marsh; 3) Digging shallow runnels to drain pooling water off the eastern half of the marsh surface; 4) Filling ditches with bailed marsh grass to restore marsh surface elevation and reduce erosion; 5) Pulling ditch plugs (if present) in the heavily ditched and bermed eastern half of the marsh to increase drainage and reduce erosion. The data gleaned from these experiments will inform the feasibility study and help DSF determine best practices for restoring the marsh—particularly those areas of the marsh that are denuded and significantly subsided.

  This activity will begin before the grant performance period and will be completed before construction to replace the undersized crossing or crossings begins. DSF's partners in this activity will be Bill Bennett (US Fish and Wildlife Service) and Jeremy Bell (The Nature Conservancy), who will both provide technical expertise, and UMM Professors mentoring student research projects, as well as various area schools who

will help with monitoring, data collection, and physical labor. This activity is linked to the outcome of "Completed Feasibility Study" and the post-grant period outcomes of "Restoration of salt-marsh function in Schoppee Marsh" and "Healthier, more productive, and more resilient Machias Bay Estuary ecosystem."

- **Monitoring:** Pre- and post-restoration monitoring data collected by students at the University of Maine at Machias (UMM), Washington Academy, and 5-12th-grade "citizen scientists." DSF has extensive experience training and working with citizen scientists on other monitoring projects and has developed citizen science data collection protocols to ensure high-quality data. This activity is linked to the outcomes Baseline data collected and Community understanding of and support for salt marsh restoration and the post-project outcome Restoration of salt-marsh ecology.

- **Execute the feasibility study**: The feasibility study will develop a hydrodynamic model of the marsh which will provide the specifications required to design the new tidal control structure(s) that will be placed in the railroad bed. Marsh surface, structure, longitudinal profile, cross-sections and surface water elevation data will be used to evaluate 4-6 foot sea-level rise and storm surge scenarios to create a HEC-RAS model to determine the hydraulics of water flow across the marsh. The design engineers will use this model to determine the size of the tidal control structure(s). The model will also be used to determine how to most effectively restore salt marsh function while reducing risk of flooding and loss, protect public and private infrastructure and property, restore diadromous fish passage, and ensure public access.

  These activities will be completed during the performance period. DSF will contract the feasibility study to an engineering firm with expertise in salt marsh restoration. We have begun informal conversations with two firms. DSF's project manager will be partnering with Bill Bennett (US Fish and Wildlife) and Jeremy Bell (The Nature Conservancy), who both have extensive experience in salt marsh restoration. This activity is linked to the grant outcome of Completed Feasibility Study and is a required input into the Engineering Design Plans 50% Complete outcome.

- **Initiate engineering design work:** DSF will engage an engineering firm to design a tidal control structure that performs to the specifications detailed in the feasibility study.

  Fifty percent of this activity will be completed by the end of the performance period. DSF will contract with an engineering firm—we have experience with several leading engineering firms, having worked with them on other projects. This activity is linked to the outcome: Engineering Design Plans 50% Complete.
  Apply for permits: This project, in the Final Design and Permitting phase, will need multiple permits and authorizations from the Army Corps of Engineers, Maine Department of Environmental Protection, USFish and Wildlife Service, the National Historic Preservation Act and the Machias Shoreland Zoning Ordinance. DSF has excellent working relationships with the issuing state and federal agencies. We anticipate that all permits will have been applied for by the end of the grant performance period.

- **Communication:** DSF has enlisted the support of the Machias **Downtown Revitalization Committee** to help engage and inform the community about the project and the importance to the downtown of a living shoreline. Currently, DSF plans two meetings, each hosted by the Committee, at which DSF and project partners will share how the restoration project and the floodwater storage ecosystem service benefit the town. The students who have been working as "citizen scientists" will present results from the data they have collected. Further engagement will happen via the local media and on our website and Facebook pages. DSF will plan at least one event that will attract state-wide media coverage.
- **Student engagement:** DSF will work with the **Downeast Coastal Conservancy** (DCC), a local land trust, to implement the educational and community outreach portion of the project. Four schools (K-12), five professors at the **University of Maine at Machias** (UMM), and the **4H SPIN program** through the UMM Cooperative Extension will instruct their students in salt marsh biology and train them to conduct student

research projects and how to be "citizen scientists." Students, both as scientists and citizen scientists will assist in collecting baseline and monitoring data and help with various restoration projects such as transplanting *Spartina* plugs and mapping the ditches, berms, and dikes.

- **Fundraising:** DSF will be lead on raising the funds required to complete the project. We anticipate having the funds pledged or in-hand at the end of this grant's performance period so that there is no delay moving forward with the next phase of the project. The amount that DSF must raise is well within our historical performance—DSF has one to two $200,000 - $400,000 projects in process every year. This activity is linked to all four of the post-performance period outcomes.

Outcome(s):

Proposed Project Outcomes

- **Baseline data collected.** Outcome measure: All relevant baseline data has been collected. Metrics include surface water elevations, longitudinal profile and cross-sections, vegetation species and % cover, pore water salinity, fish and bird presence and absence, benthic invertebrates presence and absence. Baseline data will be compared to post-project monitoring data to measure the degree and speed of restoration.

- **Adaptive management data collected.** Outcome measure: 1) The tide gate is propped open, increasing drainage and tidally deposited sediment processes; 2) Pools are drained, ditches are filled, and ditch plugs are pulled; 3) Observations generated by adaptive management procedures will inform the feasibility study.

- **Completed Feasibility Study.** Outcome measure: The feasibility study is completed per DSF specifications. The study will provide the data and analysis we need to restore marsh hydrology, and subsequently salt marsh ecosystem functions—including how to manage water flow for storm surges, 100 and 500-year floods, future sea-level rise; and impacts to surrounding landowners and infrastructure.

- **Engineering design plans.** Outcome measure: Engineering design 50% complete.

All of the above outcomes align with the Resiliency Plan (2017) in that they further the restoration of a living shoreline that will serve to store floodwaters and contribute to the resiliency of downtown Machias in the face of SLR and increasing storm frequency and intensity.

Community Outcome

- **Community understanding of and support for salt marsh restoration.** Outcome measure: 400 students, teachers, and community members participate in community meetings, trainings, data collection, or active restoration work. This amounts to more than 15% of the town's population.

Project Outcomes (Beyond Performance Period)

- **Greater resilience to sea-level rise and coastal flooding in Machias.** Outcome measure: 50 acres of restored living shoreline. This outcome fully aligns with the recommendation of the Resiliency Report (2017).

- **Hydrological function restored to Schoppee Marsh.** Outcome measure: Fully functioning tidal exchange. Tidal inundation period and frequency measured by HOBO Onset Data Loggers U20L.

- **Restoration of salt-marsh ecology:** Outcome measure: Halophytic vegetation, and typical salt marsh fish and birds have recolonized the marsh. Recolonization will be measured by ongoing post-project monitoring and compared to pre-restoration baseline data.

- **Healthier, more productive, and more resilient Machias Bay Estuary ecosystem.** Outcome measure: The estuary is large and its health and resiliency are dependent on so many variables that it will not be possible to accurately measure this outcome.
- **Community support for living shore restoration.** DSF intends to use the restoration of Schoppee Marsh to educate the community about the value of salt marshes so that the residents of Machias become more supportive of restoring additional salt marsh ecosystems.

Annual Milestones

Milestone	Completion Date
First community meeting detailing the project	Spring 2020
Marsh revegetated by transplanting salt marsh plants	Spring 2020
Baseline data collected (2018-2020)	Summer 2020
Fundraising for Phase II	Summer 2020
Feasibility study completed	Fall 2020
Second community meeting explaining project	Spring 2021
Engineering design completed	Fall 2021
Control structure completed and operational	Summer 2022
Tidal flows return (volume determined by feasibility study)	2022-2025?
Community celebration	Fall 2022
Post-project monitoring (5 years)	2027

Tracking Metrics:

Monitor Progress

The following four metrics are those DSF intends to achieve during the NFWF Coastal Resilience grant performance period.

Resilience – Outreach/Education/Technical Assistance - # gov't entities participating

DSF has engaged the US Fish and Wildlife Service (USFWS); the Maine Natural Area Program and the Maine Division of Parks and Public Lands, both divisions of the Department of Agriculture, Conservation, and Forestry (DACF); the Maine Coastal Program, a division of the Maine Department of Marine Resources; the Maine Geological Survey; the Department of Environmental Protection; the Maine Department of Transportation (DOT), which owns the railroad bed; and the US Army Corps of Engineers. DSF will engage 8 agencies or divisions of agencies. This metric will be tracked by a simple count; there are no challenges anticipated.

Resilience -- Outreach/Education/Technical Assistance - # people reached

DSF will have at least two public meetings (hosted by the Machias Downtown Revitalization Committee) to brief the community about the Schoppee restoration project. Students at UMM and those working as our project "citizen scientists" will present what they have learned. DSF will organize in the community to ensure a good turnout. We anticipate reaching directly 150. We will track this metric by having both a sign-in sheet at the public meetings and doing a headcount by staff during the meeting. Tracking this metric will be relatively easy, with a minor challenge in ensuring people sign the sign-in sheets.

Resilience - Restoration planning/design/permitting - # E&D plans developed

At the conclusion of this grant's performance period, DSF intends to have 50% of the engineering design completed for a tidal control structure that will restore the tides to Schoppee Marsh. Progress will be monitored by frequent meetings and project reports from the engineering contractor. Although the engineering firm that will do the designs has not yet been selected, DSF and our partners have worked with

many of the engineering firms in the state and we are confident both of their high level of competence and our ability to work productively with them.

Resilience – Volunteer participation - # of volunteer hours

Volunteers are a critical component of this project. DSF anticipates 500 volunteer hours; volunteer time will be tracked using sign-in/sign-out sheets that DSF staff will manage.

Project Team

Dwayne Shaw is DSF's Executive Director and will be responsible for overall management of the project. Shaw has guided development of fisheries and land conservation programs since 1989. Shaw has served on numerous fisheries-related boards and advisory committees, including the Maine Sea Grant Public Advisory Committee and the Federal Recovery Team for Endangered Atlantic Salmon.

Charlie Foster is the Habitat Restoration Project Manager for the Downeast Salmon Federation. He has over 12 years of experience as a scientist and environmental project manager with expertise in estuarine ecology, habitat restoration, and infrastructure projects. He has managed environmental projects with budgets exceeding $2M, including the restoration of a tidal passage along the Texas coast in 2014.

Jacob van de Sande has been a Land Protection Project Manager for Maine Coast Heritage Trust since 2014. In that capacity, he manages complex land purchases and restoration projects.

Jeremy M. Bell is the River and Coastal Restoration Director for The Nature Conservancy in Maine. He has nearly 20 years' experience as a restoration ecologist and project manager and is the strategy lead for coastal resiliency as well as river and coastal restoration for TNC in Maine.

Kyle Winslow is trained in Conservation Biology and has focused most of his work on restoring the endangered Atlantic salmon. He worked for the Axiom Education and Training Center offering STEM (Science, Technology, Engineering, and Math) educational activities to area youth.

Bill Bennett is a Fish and Wildlife Biologist with the USFWS Gulf of Maine Coastal Program. Bennett provides technical assistance with hydrogeomorphic assessments and development of restoration designs

The mission of the **Downeast Salmon Federation** is to conserve wild Atlantic salmon and its habitat, restore a viable sports fishery and protect other important river, scenic, recreational and ecological resources in eastern Maine. DSF has a thirty-eight-year history removing dams, replacing barriers to fish passage, restoring habitat, and returning diadromous fish to watersheds where they have long been extinct.

Other

Transferability: The restoration of Schoppee Marsh will be the first large salt marsh restoration project in eastern Maine. It will also be the first restoration of a natural area in order to provide protection from floods, storm surges, and sea-level rise. As the first such project, it provides us with a distinct and valuable opportunity: To educate and engage the general public in the possibility and importance of using natural systems to protect manmade infrastructure. An example of the need to introduce such thinking is the "Washington County Hazard Mitigation Plan," which was submitted to FEMA's Pre-Disaster Mitigation Program in January 2019. This plan lists hundreds of needed infrastructure changes, but not one use of a natural system for hazard mitigation.

In designing this project, DSF has put considerable emphasis on community outreach and education—specifically to develop the community and political support for future projects. The Natural Resource Resilience Program evaluates proposed projects, in part, on their transferability. DSF asserts that political and community support is critical to transferability. To further support the transferability of the lessons learned at Schoppee, DSF intends to work with local contractors to develop in-region expertise in salt marsh restoration and living shoreline construction. Finally, DSF will hold a post-project debrief with all key partners (including local, state, and federal agencies) to evaluate the project to ensure that the lessons learned are incorporated into future projects.

Sustainability: DSF will transfer the tidal control structures to the State of Maine at project completion.

Photographs

Figure 1: Restricted Tidal Flow. Looking west on the Sunrise Trail. Machias River is on the left and Schoppee Marsh on the right side of the trail. Credit Russell Heath, Downeast Salmon Federation.
Figure 2: Pannes. The brown area has subsided approximately one foot according to a LIDAR survey, and exhibits typical panne characteristics such as sparse cover of common glasswort (*Salicornia depressa)*, algal mats, and cracked mud due to impaired hydrology. Credit Russell Heath, Downeast Salmon Federation.
Figure 3: Tide Gate. The tide gate preventing saltwater entry into the western half of Schoppee Marsh. Even if the gate were removed, the culvert would not be large enough to ensure adequate saltwater inundation of the marsh. Credit Shri Verrill, Downeast Salmon Federation.

Literature Cited

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National Oceanic and Atmospheric Administration, 2015. Guidance for Considering the Use of Living Shorelines. 36pp. https://www.habitatblueprint.noaa.gov/wp-content/uploads/2018/01/NOAA-Guidance-for-Considering-the-Use-of-Living-Shorelines_2015.pdf

Elevations on Mean Lower Low Water

Station: 8411060, Cutler Farris Wharf, ME
Status: Accepted (Jun 28 2016)
Units: Feet
Control Station: 8413320 Bar Harbor, ME
T.M.: 0
Epoch: 1983-2001
Datum: MLLW

Datum	Value	Description
MHHW	14.55	Mean Higher-High Water
MHW	14.10	Mean High Water
MTL	7.25	Mean Tide Level
MSL	7.19	Mean Sea Level
DTL	7.28	Mean Diurnal Tide Level
MLW	0.40	Mean Low Water
MLLW	0.00	Mean Lower-Low Water
NAVD88	7.54	North American Vertical Datum of 1988

LEGEND

- PD0127
- PD128
- TIDAL CROSSING
- HAT 2015 BY MGS

N

0

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2021 Request for Proposals for Feasibility Study

The Schoppee Marsh restoration project plans to restore full tidal flows and full fish access to Schoppee Marsh, a 40-acre salt marsh at the head of Machias Bay. Tidal flows into the marsh were restricted in the early 1900s when a railroad was built between it and the bay. A single 42-inch diameter culvert with a top hinge tide gate preventing salt water from entering but allowing water to exit the marsh was built through the railroad bed. The only saltwater to enter the marsh flows from an adjoining marsh over a height of land at high tide. The volume of saltwater flowing from the adjoining marsh is not enough to fully flood Schoppee and, at lower high tides, when the top of the tide is below the height of land, no water at all gets into Schoppee. The drain culvert is unable—due to size or placement—to fully drain the marsh so that water backs up behind the railroad bed between tides.

Although some saltwater is flooding the marsh, it is effectively inaccessible to fish. None of the benefits that a salt marsh provides—food, protection from predators, spawning and rearing habitat—are available to resident or migrating fish.

A preliminary hydrological survey (done by the US Fish and Wildlife Service and the Downeast Salmon Federation (DSF)) of the marsh indicates that the marsh bed has subsided. Non-salt marsh plants have colonized some areas and large areas have reverted to mudflats and are devoid of any plant life due the impaired hydrology—unlike the adjoining marsh which, with full tidal flows, is lush with salt marsh grasses and other halophilic plants.

Work to be done: The restoration project will include the following tasks:

1. Feasibility study to determine all that needs to be done to fully restore the marsh—including the necessary volume of the tidal flow, the size of the opening required, and whether the marsh substrate needs to be raised by thin layer deposition of fill to ensure recolonization of saltmarsh vegetation.
2. Design tidal flow control structure. This is likely to be a small bridge but could also be a series of culverts. The structure must be “railroad ready,” that is, able to support a railroad if the bed is reconverted to a working railroad.
3. Obtain all necessary permits and approvals.
4. Thin layer substrate deposition to raise marsh bed. Multiple depositions may be required if the marsh bed must be raised by a substantial amount.
5. Transplant spartina plugs and other salt marsh vegetation.
6. Construct tidal flow control structure.
7. Return tidal flows to marsh.
8. On-going monitoring to chart progress as salt marsh recovers.

This request for proposals (RFP) is **specifically for the completion of Task 1 and 2**, from which will come recommendations for the remaining steps, such as targeted restoration measures. We are looking for detailed proposals with potential strategies laid out. A detailed budget must be included as well. I am available to answer any questions as you develop for proposal. I have attached some of the pertinent background information in my email, including a project map, preliminary tidal cycle flow data, LiDAR elevation data, and the current location of the two drainage culverts. This project is being carried out via grant funding from the National Fish and Wildlife Foundation (NFWF) and all work must align with their guidelines, as well as those from DSF. **Please submit your proposals to the email below by Tuesday, August 17th, 2021**. Selection of a vendor will be made based upon the following criteria:

1. Experience with similar projects and a proven track record of restoration success.
2. Expertise of the project staff (hydrology, salt marsh ecology, fisheries science).
3. Proposal outlines in sufficient detail the steps to achieve restoration of the marsh.
4. Proposal includes a budget that is consistent with the project expectations.
5. Proposal includes a timeline for completion that is consistent with project expectations.

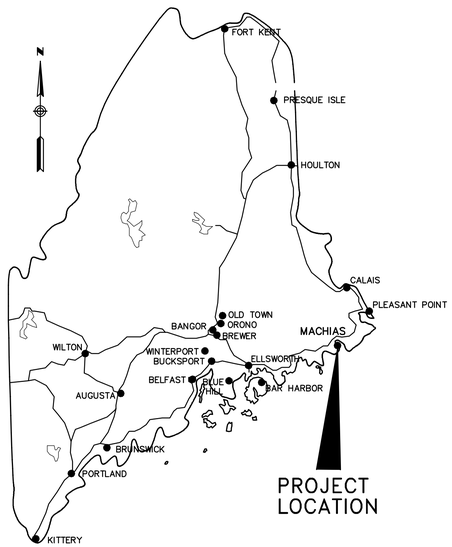
Sincerely,

Charlie Foster
Habitat Restoration Program Manager
Downeast Salmon Federation
(207) 619-3474
charlie@mainesalmonrivers.org

Wastewater Treatment Plant

TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION-PHASE 1

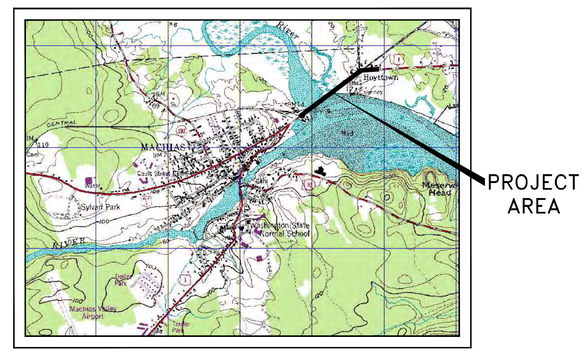


LOCATION MAP

PROJECT NO. 1300
CWSRF NO. C230093-07

JULY, 2012

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
LICENSED PROFESSIONAL ENGINEER



AREA MAP

OLVER ASSOCIATES INC.

ENVIRONMENTAL ENGINEERS

290 MAIN STREET WINTERPORT, MAINE

OCT, 2013

GENERAL NOTES

1. UTILITY LOCATIONS AS SHOWN ARE APPROXIMATE BASED ON AVAILABLE INFORMATION AT TIME OF SURVEY. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD LOCATION AND CONFIRMATION OF ALL EXISTING UTILITIES INCLUDING SEWER, DRAINAGE, WATER, ELECTRICAL, TELEPHONE, AND CABLE PIPES AND CONDUITS. IT IS POSSIBLE THAT OTHER ACTIVE AND INACTIVE UTILITIES MAY EXIST IN THE PROJECT AREA. CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION.

2. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE OWNER OF EACH UTILITY TO FIELD LOCATE UTILITIES AND TO MINIMIZE DISRUPTION. CONTINUOUS SEWER AND DRAIN SERVICE MUST BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.

3. TEST PITS ARE REQUIRED IN ADVANCE AT ALL EXISTING UTILITY CROSSINGS AND AS NOTED ON PLANS TO VERIFY LOCATION AND ELEVATION OF POTENTIAL CONFLICTS.

4. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ANY UNDERGROUND PUBLIC OR PRIVATE ELECTRICAL AND TELEPHONE UTILITIES WITH DIG–SAFE OR OWNER PRIOR TO EXCAVATION.

5. BORING AND GEOTECHNICAL INFORMATION IS SHOWN FOR CONTRACTOR'S REFERENCE ONLY. ACTUAL SUBSURFACE CONDITIONS MAY VARY. GEOTECHNICAL REPORT FOR RIVER CROSSING AREA IS INCLUDED AS APPENDICES TO SPECIFICATIONS.

6. CONTRACTOR SHALL CONTACT OWNERS OF UTILITY POLES ADJACENT TO EXCAVATION AREAS TO ARRANGE POLE SUPPORT DURING EXCAVATION AND ARRANGE THE INSTALLATION OF TEMPORARY PROTECTIVE COVERS ON ADJACENT OVERHEAD ELECTRICAL LINES WITH BANGOR HYDRO ELECTRIC COMPANY IF REQUIRED.

7. CONTRACTOR SHALL EXERCISE APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN ACCORDANCE WITH ACCEPTED PRACTICE, APPLICABLE LAWS AND REGULATIONS, REQUIREMENTS OF THESE CONTRACT DOCUMENTS, AND PROJECT NRPA PERMIT. STANDARD CONDITIONS FOR NRPA PERMIT ARE INCLUDED IN APPENDIX.

8. CONTRACTOR SHALL CONTROL DUST GENERATED DURING PROJECT TO A LEVEL SATISFACTORY TO OWNER AND ENGINEER.

9. CONTRACTOR SHALL PROPERLY PROTECT AND AVOID DISTURBING PROPERTY PINS AND MONUMENTS. IF DISTURBED, THE PROPERTY PIN OR MONUMENT SHALL BE RESET AT CONTRACTOR'S EXPENSE BY A REGISTERED LAND SURVEYOR APPROVED BY THE ENGINEER.

10. ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UNLESS OTHERWISE NOTED. LOAM AND SEED ALL DISTURBED VEGETATED AREAS WITH 4" OF LOAM, HYDROSEED AND MULCH.

11. ALL TRENCH ROUTES IN PAVED AREAS SHALL BE SAW CUT PRIOR TO DISTURBANCE OF PAVEMENT AND AGAIN PRIOR TO PLACEMENT OF FINAL PAVEMENT. REPAVE WITH 4" PAVEMENT MINIMUM OR MATCH EXISTING THICKNESS IN MDOT RIGHT–OF–WAY WORK AREAS AS NOTED ON DETAILS.

12. CONTRACTOR IS RESPONSIBLE FOR THE LAYOUT OF ALL PROPOSED WORK. ENGINEER WILL ASSIST ONLY IN PROVIDING REFERENCE POINTS AND ELEVATION DATA.

13. PROPERTY BOUNDARIES, EASEMENTS, AND RIGHT–OF–WAY LIMITS SHOWN ON PLANS ARE APPROXIMATE BASED ON FIELD EVIDENCE OBSERVED, AVAILABLE TAX MAPS, AND MDOT RIGHT–OF–WAY PLANS AND ARE INCLUDED FOR REFERENCE ONLY. NO LEGAL REPRESENTATION IS INTENDED NOR WAS ANY FORMAL BOUNDARY SURVEY CONDUCTED.

14. IF LEDGE IS ENCOUNTERED, CONTRACTOR SHALL CONDUCT A PRE–BLAST SURVEY OF ALL BUILDINGS WITHIN 500 FEET OF BLAST AREA PRIOR TO BLASTING IN ACCORDANCE WITH SPECIFICATIONS.

15. UNSUITABLE FILL MAY BE ENCOUNTERED DURING EXCAVATION. IF UNSUITABLE FILL IS ENCOUNTERED, IT SHALL BE REPLACED WITH SELECT GRAVEL BACKFILL OR AGGREGATE BASE AFTER REVIEW AND APPROVAL BY ENGINEER.

16. CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY TO ENSURE THAT ALL WORK MEETS ALL OSHA, DEPARTMENT OF LABOR, AND OTHER APPLICABLE CODE AND HEALTH AND SAFETY REQUIREMENTS.

17. ALL SEWER LINES SHALL BE PROPERLY FLUSHED BY CONTRACTOR AT COMPLETION OF PROJECT, OR WHENEVER CONSTRUCTION DEBRIS ENTERS OPEN PIPE WORK. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT CONSTRUCTION MATERIALS AND DEBRIS FROM ENTERING OPEN SEWER LINES AND PUMP STATION WET WELL AND SHALL BE RESPONSIBLE FOR THE COST OF ANY REPAIRS FROM DAMAGE THAT RESULTS FROM SUCH DEBRIS. GRAVITY FLUSHING IS NOT ACCEPTABLE. THE NEW WET WELL SHALL BE FLUSHED AND VACUUM CLEANED PRIOR TO START UP OF NEW PUMP STATION.

18. ALL SEWER AND FORCE MAINS WITH LESS THAN FIVE FEET OF COVER SHALL BE INSULATED WITH TWO INCHES OF RIGID INSULATION AT FULL TRENCH WIDTH.

19. PIPE PENETRATIONS THROUGH WET WELL AND FORCE MAIN DISCHARGE MANHOLE WHERE INDICATED SHALL BE CORED AND DOUBLE LINK SEALED. SINGLE LINK SEALS ARE ACCEPTABLE THROUGH WET WELL WALLS WHERE A DOUBLE LINK SEAL WILL NOT FIT.

20. COORDINATE ALL EARTHWORK BETWEEN CIVIL, MECHANICAL, AND ELECTRICAL SHEETS FOR PIPING AND CONDUIT INSTALLATION.

21. EQUIPMENT LAYOUT SHOWN ON PLANS IS BASED ON SPECIFIED PRODUCTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED AFTER SUBMITTAL REVIEW OF ALL FINAL EQUIPMENT MODELS.

22. WORK UNDER THIS CONTRACT SHALL BE PERFORMED WITHIN A STATE OF MAINE DEPARTMENT OF TRANSPORTATION ROAD RIGHT–OF–WAY, AND IS SUBJECT TO ALL RULES AND REGULATIONS OF THE MDOT. EXCAVATIONS IN THE ROADWAY MUST BE BACKFILLED NIGHTLY AND ALL WORK MUST BE CONDUCTED IN A MANNER ACCEPTABLE TO THE STATE MDOT AND IN COMPLIANCE WITH THE TOWN'S MDOT PERMIT INCLUDED IN SPECIFICATIONS.

23. BUILDING SANITARY SEWER STUBS SHALL BE PROVIDED FROM MAIN SEWERS TO RIGHT–OF–WAY FOR EACH PROPERTY AS SHOWN ON THE PLANS. PROVIDE MINIMUM SLOPE OF 0.02 FOR NEW 4"Ø SERVICES AND 0.01 FOR 6"Ø SERVICES AND MEET SPECIFIED ELEVATIONS WHERE CALLED OUT ON DRAWINGS. PROVIDE WITNESS STAKE AT ENDS OF CAPPED STUBS.

24. MANHOLE RIM ELEVATIONS ARE PROVIDED ON PLAN SHEETS TO ESTABLISH HEIGHT OF NEW STRUCTURES FOR BIDDING PURPOSES. EXACT FINAL RIM ELEVATIONS SHALL BE ESTABLISHED IN THE FIELD SUCH THAT TOP OF RIM IS 0.05' BELOW FINAL PAVEMENT OR 0.10' BELOW GRADE IN NON–PAVED AREAS. ALL NEW MANHOLE RIMS IN PAVED AREAS SHALL BE SET TO FINAL GRADE AFTER APPLICATION OF PAVEMENT BINDER.

25. RESET OR REPLACE ALL SITE FEATURES DISTURBED BY WORK INCLUDING SIDEWALKS, DRIVEWAYS, SIGNS, MAILBOXES, PLANTERS, LANDSCAPING, BITUMINOUS CURB, ETC.

26. NO SEWER SERVICES SHALL BE CONNECTED TO NEW SYSTEM UNTIL FINAL ACCEPTANCE OF PUMP STATION AND SEWER MAIN BY OWNER.

27. INTENTION IS TO CONDUCT RIVER CROSSING WITH FORCE MAIN BY DIRECTIONAL BORING. ACCESS TO WORK AREAS FOR BORING PITS WILL BE ARRANGED BY OWNER.

28. PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL FORCE MAIN RIVER CROSSING SHALL BE COMPLETED PRIOR TO INSTALLATION OF PROPOSED MH STA 1+98 AND WET WELL STA 13+00 TO ACCOMMODATE BOTH HORIZONTAL AND VERTICAL ALIGNMENT DESIGN REQUIREMENTS.

LEGEND

- EXISTING SEWER MANHOLE
- PROPOSED SEWER MANHOLE
- EXISTING SEWER LINE
- EXISTING SEWER SERVICE
- PROPOSED SEWER LINE
- PROPOSED SEWER SERVICE
- EXISTING COMBINED SEWER
- EXISTING FORCE MAIN
- PROPOSED FORCE MAIN
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING WATER SERVICE
- PROPOSED WATER LINE
- PROPOSED WATER SERVICE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN SERVICE
- EXISTING UNDERDRAIN
- PROPOSED UNDERDRAIN
- PROPOSED AIR LINE
- PROPOSED VENT
- EXISTING CULVERT
- PROPOSED CULVERT
- GRADING CUT LINE
- GRADING FILL LINE
- GRADING MATCH LINE
- EXISTING CATCH BASINS
- PROPOSED CATCH BASIN
- EXISTING WATER WEDGE VALVE
- EXISTING WATER CURB STOP
- PROPOSED WATER WEDGE VALVE OR CURB STOP
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WELL
- CAPPED LINE
- EXISTING TELEPHONE MANHOLE/THERMOSTAT
- EXISTING CABLE TV MANHOLE
- EXISTING ELECTRICAL MANHOLE

- EXISTING BURIED TELEPHONE CABLE
- EXISTING BURIED TV CABLE
- EXISTING BURIED ELECTRIC CABLE
- EXISTING OVERHEAD ELECTRIC CABLE
- EXISTING OVERHEAD TELEPHONE CABLE
- UTILITY POLE
- UTILITY POLE ANCHOR
- UTILITY PEDESTAL
- BURIED CABLE JUNCTION BOX
- TRANSFORMER ON CONC. PAD
- STREET LIGHT
- PEDESTRIAN SIGNAL LIGHT
- DECORATIVE STREET LIGHT
- TRAFFIC SIGNAL POLE
- RAILROAD CROSSING SIGN/SIGNAL
- SATELLITE DISH
- RIP–RAP
- STONE WALL
- CONCRETE OR GRANITE WALL
- DRAINAGE DITCH OR SWALE
- STREAM
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING SOFTWOOD TREE
- EXISTING HARDWOOD TREE
- EXISTING TREE CLUSTER
- EXISTING BUSH
- BRUSH LINE
- TREE LINE

- RECEPTACLE
- LIGHT SWITCH
- SIDEWALK RAMP
- EXISTING CURB (TYPE)
- PROPOSED CURB
- SURVEY CONTROL POINT
- PROPERTY IRON PIN
- RIGHT–OF–WAY MONUMENT
- RIGHT–OF–WAY LINE
- LOT LINE
- EASEMENT
- TEST PIT REQUIRED
- EXISTING MAILBOX
- PROPANE TANK
- EXISTING SIGNS
- PROPOSED SIGN
- EXISTING BOLLARD/POST
- PROPOSED BOLLARD
- EXISTING FLAGPOLE
- FENCE
- GUARD RAIL
- HANDICAPPED SYMBOL
- LEDGE OUTCROP
- LEDGE ENCOUNTERED
- NO REFUSAL
- MONITORING WELL
- TEST PIT, BORING, OR PROBE
- WETLANDS AREA

ABBREVIATIONS*

AB	ANCHOR BOLTS
AC	ASBESTOS CEMENT
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX;±	APPROXIMATELY
AVG	AVERAGE
ARV	AIR RELIEF VALVE
BHE	BANGOR HYDRO ELECTRIC
BITUM	BITUMINOUS
BL;℄	BASELINE
BLDG	BUILDING
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
BV	BACK VENT
C	CHANNEL
℄	CENTERLINE
CB	CATCH BASIN
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CJ	CONTROL JOINT
CL	CLEARING LIMITS OR CENTERLINE
CLG	CEILING
CLR	CLEAR
CL_2	CHLORINATION
CMP	CENTRAL MAINE POWER
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CONC.	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CPE	CORRUGATED POLYETHYLENE PIPE
CS	COMBINED SEWER/CARBON STEEL
CTS	COPPER TUBE SIZE
CU	COPPER
CULV	CULVERT
D	DRAIN OR DIAMETER
DBC	DIRECT BURIAL CABLE
DEP	DEPT OF ENVIRONMENTAL PROTECTION
DI	DUCTILE IRON
DIA;ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSIONS
DIN	GERMAN INSTITUTE FOR STANDARDIZATION
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DN	DOWN
DR	DRIVEWAY
DRN	DRAIN
DW	DOMESTIC WATER OR DRIVEWAY
DWV	DRAIN, WASTE, AND VENT
E	MODULUS OF ELASTICITY OR ELECTRIC
EA	EACH
EE	EACH END
EF	EACH FACE
EHW	EXTREME HIGH WATER
EJ	EXPANSION JOINT
EL;ELEV	ELEVATION
ELEC COND	ELECTRICAL CONDUIT
ELW	EXTREME LOW WATER
EMEC	EASTERN MAINE ELECTRICAL CO–OP INC.
EMH	ELECTRIC MANHOLE
EQUIP	EQUIPMENT
EST	ESTIMATED
EW	EACH WAY
EXIST, EX	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
EXTEN	EXTENSION
Fb	BENDING STRESS
Fc	COMPRESSIVE STRESS
Ft	TENSILE STRESS
FC	FIRE CODE
FCO	FLOOR CLEANOUT
FCS	FLOW CONTROL STRUCTURE
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FF;FIN FLR	FINISH FLOOR
FIN	FINISHED
FIN GR	FINISH GRADE
FLG	FLANGED
FLR	FLOOR
FLR'G	FLOORING
FM	FORCE MAIN
FOS	FACE OF STUD
FR	FIRE RESISTANT
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
G	GAS LINE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GDN	GARDEN
GL	GLASS LINED
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GROUND
GWB	GYPSUM WALLBOARD
H	HEIGHT
HB	HOSE BIBB
HC	HOSE CLEANOUT
HDW	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
H P	HIGH POINT
HP	HORSEPOWER
HPC	BEGIN HORIZONTAL CURVE
HPI	HORIZONTAL CURVE TANGENT INTERSECTION
HPT	END HORIZONTAL CURVE
HT	HEIGHT
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IJ	ISOLATION JOINT
IN	INCHES
INF	INFLUENT
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
I\O	INPUT/OUTPUT
IP	IRON PIPE
JS	JANITOR SINK
JB	JUNCTION BOX
KD	KILN DRIED
LAT	LATERAL
LAV	LAVATORY
LE	LAGOON EFFLUENT
LF	LINEAR FEET
LG	LONG OR LARGE
L	LEFT OR LENGTH
LKR	LOCKERS
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
LP	LOW POINT OR LIQUID PROPANE
LR	LONG RADIUS
LT	LEFT
MANUF	MANUFACTURER
MAT'L	MATERIAL
MB	MACHINE BOLTS
MAX	MAXIMUM
MC	MOISTURE CONTENT
MCC	MOTOR CONTROL CENTER
MDOT	MAINE DEPARTMENT OF TRANSPORTATION
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MHW	MEAN HIGH WATER
MIL	1/1000 INCH
MIN	MINIMUM
MJ	MECHANICAL JOINT
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MLW	MEAN LOW WATER
MM	MILLIMETER
MO	MASONRY OPENING
MON	MONUMENT
MPS	MAINE PUBLIC SERVICE
MRL	MEAN RIVER LEVEL
MS	MOISTURE SENSOR
MSL	MEAN SEA LEVEL
MTL	METAL
MW	MONITORING WELL
N/F	NOW/FORMERLY
NO	NUMBER
NPS	NATIONAL PARK SERVICE
NR	NO REFUSAL
NRPA	NATIONAL RESOURCES PROTECTION ACT
NS	NEAR SIDE
NTS	NOT TO SCALE
NYNEX	NEW ENGLAND TELEPHONE (BELL ATLANTIC)
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OPER	OPERATOR
OR	ORANGEBURG PIPE
PE	POLYETHYLENE OR PLAIN END
PEN	PENETRATION
PERF	PERFORATED
PEX	CROSS–LINKED POLYETHYLENE
PD	PURGE DIFFUSER
PI	PROPERTY IRON
PL	PLATE OR PROPERTY LINE
PLYWD	PLYWOOD
POLY	POLYETHYLENE PLASTIC
POTW	PUBLICLY OWNED TREATMENT WORKS
PROP	PROPOSED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
Q_{PK}	PEAK FLOW
R	RADIUS OR RIGHT
RAD	RADIUS
RAN	RANGE
RAS	RETURN ACTIVATED SLUDGE
RCEP	REINFORCED CONCRETE ELLIPTICAL PIPE
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCED OR REINFORCING BAR
RED	REDUCING
REF	REFRIGERATOR
REQ	REQUIRED
RESIL	RESILIENT
RET. WALL	RETAINING WALL
RGS	RIGID GALVANIZED STEEL
R.O.	ROUGH OPENING
RPM	REVOLUTIONS/MINUTE
RT	RIGHT
R/W	RIGHT OF WAY
S	SLOPE OR SEWER
SAN	SANITARY
SDR	STANDARD DIMENSION RATIOS
SCH	SCHEDULE
SCP	SURVEY CONTROL POINT
SCR	SCREENINGS
SECT	SECTION
SF	SQUARE FEET
SERV	SERVICE
SHT	SHEET
SHD	ROAD SHOULDER
SI	SPRAY IRRIGATION
SICPE	SMOOTH INTERIOR CORRUGATED POLYETHYLENE
SLG	SLUICE GATE
SPEC	SPECIAL
SPEC'S	SPECIFICATIONS
SP	SUMP PUMP
SQ	SQUARE
SR	SHORT RADIUS
SWR	SHOWER
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SUSP	SUSPENDED
SW	SIDEWALK OR SEAWATER
T	TELEPHONE OR THICKNESS
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
TBM	TEMPORARY BENCH MARK
TDH	TOTAL DYNAMIC HEAD
TEFC	FULLY ENCLOSED MOTOR
THR'HOLD	THRESHOLD
TOP	TOP OF PLATE
TYP	TYPICAL
UG	UNDERGROUND
URN	URINAL
UST	UNDERGROUND STORAGE TANK
V	VENT
VAR	VARIES
VB	VAPOR BARRIER OR VACUUM BREAKER
VC	VITRIFIED CLAY
VER	VERIZON TELEPHONE
VERT.	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VPC	BEGIN VERTICAL CURVE
VPI	VERTICAL CURVE TANGENT INTERSECTION
VPT	END VERTICAL CURVE
VTR	VENT THROUGH ROOF
W	WATER OR WIDTH
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WC	WATER CLOSET
WCO	WALL CLEANOUT
WD	WOOD
WF	WIDE FLANGE
WH	WATER HEATER
WLD	WELDED
WR	WATER RESISTANT
WS	WATER SURFACE
W'STRIPPING	WEATHER STRIPPING
WW	WET WELL
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH

*THESE ARE GENERAL ABBREVIATIONS. NOT ALL APPEAR ON THESE DRAWINGS.

INDEX

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: EWH	DR.BY: NWD	CK.BY: MHO

TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION–PHASE 1

GENERAL NOTES AND INDEX

SCALE: NONE	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: G–1

PROVIDE 5 LF 8"ø PVC SEWER STUB (NW) FROM MH STA 1+98 AT S=0.005. CAP AT INV. EL. 7.98.

PROVIDE NEW MH STA 1+98. (SEE NOTE NO. 3.)

PROVIDE 12 LF 6"ø PVC SEWER STUB (W) FROM MH STA 1+98 AT S=0.01. CAP AT INV. EL. 8.24

PROVIDE 93 LF 8"ø PVC SEWER.

PROVIDE 69 LF 8"ø PVC SEWER.

PROVIDE NEW MH STA 0+28.

PROVIDE 24 LF 8"ø PVC SEWER.

PROVIDE NEW CORE AND BOOT AT MH STA 0+00 TO CONNECT PROPOSED 8"ø PVC SEWER. (SEE NOTE NO. 4.)

RESTORE BIT. CURB AND SIDEWALK WHERE DISTURBED BY NEW WORK.

CONNECT PROPOSED 6"ø SDR 11 PE FM TO MH STA. 1+58 WITH CORE AND LINK SEAL. (SEE DETAIL SHEET C-5.)

APPROXIMATE LOCATION OF HORIZONTAL DIRECTIONAL DRILLING PIT. (SEE NOTE NO. 1.)

RESTORE BIT. SIDEWALK WHERE DISTURBED BY NEW WORK.

PROVIDE 6"ø SDR 11 PE FUSED FITTING AS REQUIRED FOR VERTICAL ALIGNMENT.

RESTORE STATE OF MAINE GRAVEL TRAIL WHERE DISTURBED BY NEW WORK. (SEE NOTE NO. 5.)

PROVIDE 700 LF 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING. (SEE NOTES NO. 1, 2, AND 3.)

REMOVE AND RESET SIGN AS REQUIRED FOR NEW WORK.

REMOVE AND RESET EXIST. PICNIC TABLE AS REQUIRED FOR NEW WORK.

RESTORE BIT. DRIVEWAY WHERE DISTURBED BY NEW WORK. (TYP.)

2" ø PVC CONDUIT FOUND AND REPAIRED AT STA 1+41.

PROVIDE NEW MH STA 1+01.

RESTORE PARKING LOT PAVEMENT MARKINGS IF DISTURBED BY NEW WORK.

TBM: FLAGGED NAIL IN POLE #28.5D EL. 14.49

TBM: FLAGGED NAIL IN POLE #28.5 EL. 14.30

TBM: FLAGGED NAIL IN POLE #280/30 EL. 12.42

KILTON LANE

DOWNEAST SUNRISE TRAIL

MAIN STREET (U.S. ROUTE 1)

MIDDLE RIVER

MACHIAS RIVER

MATCH LINE (SEE SHEET C-2)

STA. 9+00

PLAN

SCALE: 1"=40'

NOTES:

1) DESIGN INTENT IS TO LOCATE THE FORCEMAIN AT A TWENTY-FIVE FOOT OFFSET FROM THE TOE OF THE SLOPE OF THE CAUSEWAY RIVER CROSSING AREA IN ACCORDANCE WITH THE REQUIREMENTS OF THE MAINE DEPARTMENT OF TRANSPORTATION. THE EXACT LOCATION AND PROFILE OF PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING TO BE PROPOSED BY THE DRILLING CONTRACTOR AND APPROVED BY ENGINEER AND THE MAINE DEPARTMENT OF TRANSPORTATION PRIOR TO BEGINNING WORK.

2) PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING PROFILE SHALL HAVE A MINIMUM FIVE FEET OF COVER ALONG ENTIRE ROUTE.

3) THE PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING SHALL BE INSTALLED AND PERMITTED TO STABILIZE TO ACCOUNT FOR PULL-BACK PRIOR TO CONNECTION TO FORCEMAIN DISCHARGE MANHOLE (STA 1+98). PROVIDE 6"ø SDR 11 PE BUTT FUSED 45° ELBOW TO DIVERT PUMPED FLOW TOWARD THE 8"ø PVC INVERT OUT OF MH STA 1+98.

4) MODIFY EXISTING MANHOLE CONCRETE BENCH AS REQUIRED TO PROVIDE NEW INVERT CHANNEL FOR PROPOSED 8"Ø PVC SEWER.

5) NOTIFY MAINE DEPARTMENT OF CONSERVATION PRIOR TO CONDUCTING WORK NEAR GRAVEL TRAIL. PROVIDE TEMPORARY ALTERNATIVE ACCESS AROUND WORK AREA TO TRAIL SYSTEM. REMOVE EXISTING GRAVEL MATERIAL AND SALVAGE FOR REPLACEMENT IN TRAIL. IF INSUFFICIENT MATERIAL CAN BE SALVAGED, MATCH EXISTING MATERIAL PER MDOT REQUIREMENTS.

6) LOCATION OF EXISTING UNDERGROUND TELEPHONE IS APPROXIMATE BASED ON AVAILABLE INFORMATION AS PROVIDED BY UTILITY COMPANY. CONDUCT TEST PITS IN ADVANCE AS INDICATED TO VERIFY EXACT LOCATION AND ELEVATION. ENGINEER MAY MODIFY DESIGN TO PROVIDE ADDITIONAL HORIZONTAL SEPARATION BETWEEN EXISTING UNDERGROUND TELEPHONE AND PROPOSED SEWER.

7) SOURCE OF SOILS BORING INFORMATION ON THIS SHEET IS EXPLORATIONS AND GEOTECHNICAL ENGINEERING SERVICES, PROPOSED EAST SIDE SEWER EXTENSION, MACHIAS, MAINE BY S.W. COLE ENGINEERING INC. DATED MARCH 06, 2012 IN APPENDIX OF SPECIFICATIONS. BORINGS ARE SHOWN OUT OF PHASE AS NOTED BY ELEVATION.

PROVIDE 24 LF 2" RIGID INSULATION FULL TRENCH WIDTH.

PROVIDE NEW CORE AND BOOT AT MH STA 0+00 TO CONNECT PROPOSED 8"ø PVC SEWER. (SEE NOTE NO. 4.)

CONNECT TO PROPOSED 12 LF 6"ø PVC SEWER STUB (W) AT INV. IN EL. 8.10.

CONNECT TO PROPOSED 5 LF 8"ø PVC SEWER STUB (NW) AT INV. IN EL. 7.95.

CONNECT TO PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN (NE) AT INV. EL. 8.00 WITH CORE AND LINK SEAL. (SEE NOTE NO. 3 AND DETAIL SHEET C-5.)

PROVIDE 6"ø SDR 11 PE FUSED FITTING AS REQUIRED FOR VERTICAL ALIGNMENT.

PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING (SEE NOTES NO. 1, 2, 3.)

PROVIDE 69 LF 2" RIGID INSULATION FULL TRENCH WIDTH.

PROVIDE 93 LF 2" RIGID INSULATION FULL TRENCH WIDTH.

8"ø PVC SEWER S=0.0056

8"ø PVC SEWER S=0.005

8"ø PVC SEWER S=0.005

6"ø SDR 11 PE FM

APPROX. EXISTING RIVER BOTTOM PROFILE

MEAN SEA LEVEL EL. 0.00±

5' MIN. COVER (TYP.)

top of heavy riprap

bottom of heavy riprap

B-1 REFUSAL @ EL. -14.6

B-2 REFUSAL @ EL. -23.4 (SEE NOTE NO. 7.)

B-3 NO REFUSAL @ EL. -41.9 (SEE NOTE NO. 7.)

B-4 NO REFUSAL @ EL. -41.6 (SEE NOTE NO. 7.)

PROFILE

SCALE: 1"=40' HORIZ.
1"=4' VERT.

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STATE OF MAINE — MANDY HOLWAY OLVER No. 5765 — LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION
OCT, 2013	RECORD DRAWING
9/2012	ADDED STUB FOR RAILROAD BUILDING

DES.BY: EWH | DR.BY: AWL/NWD | CK.BY: MHO

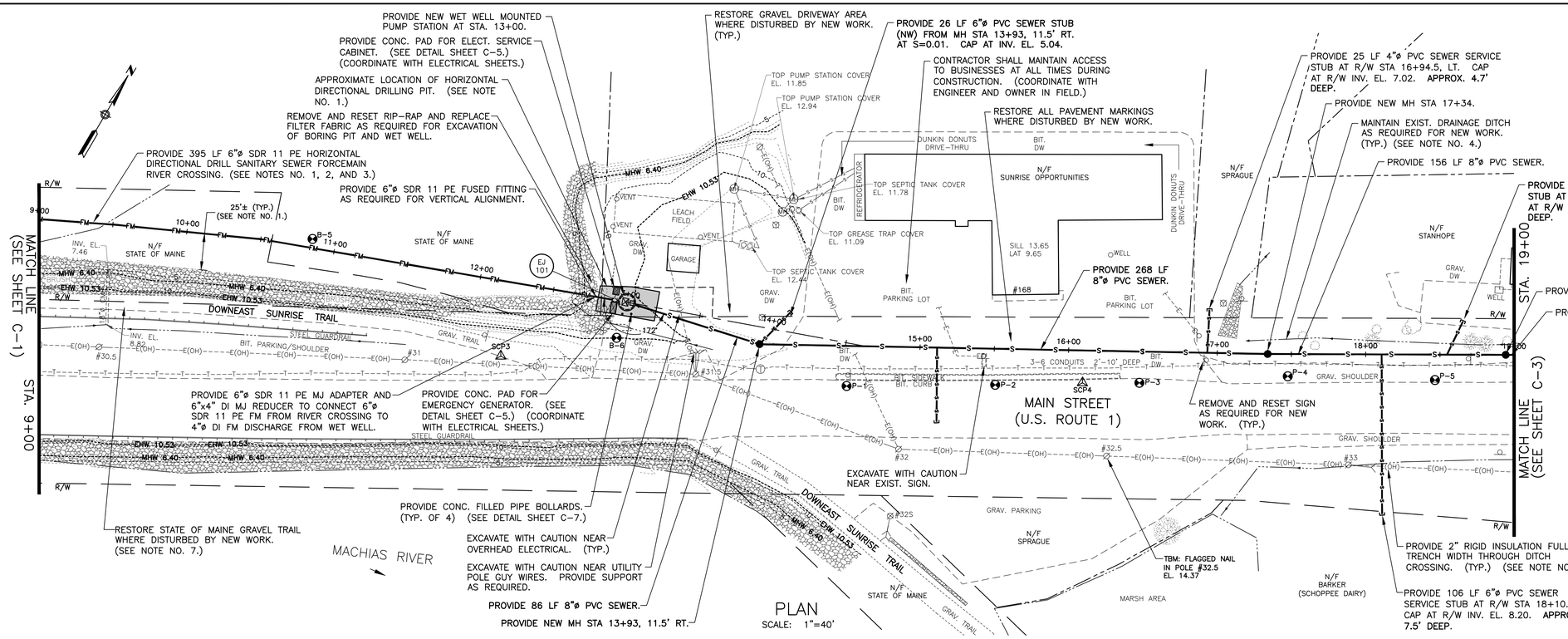
TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION-PHASE 1

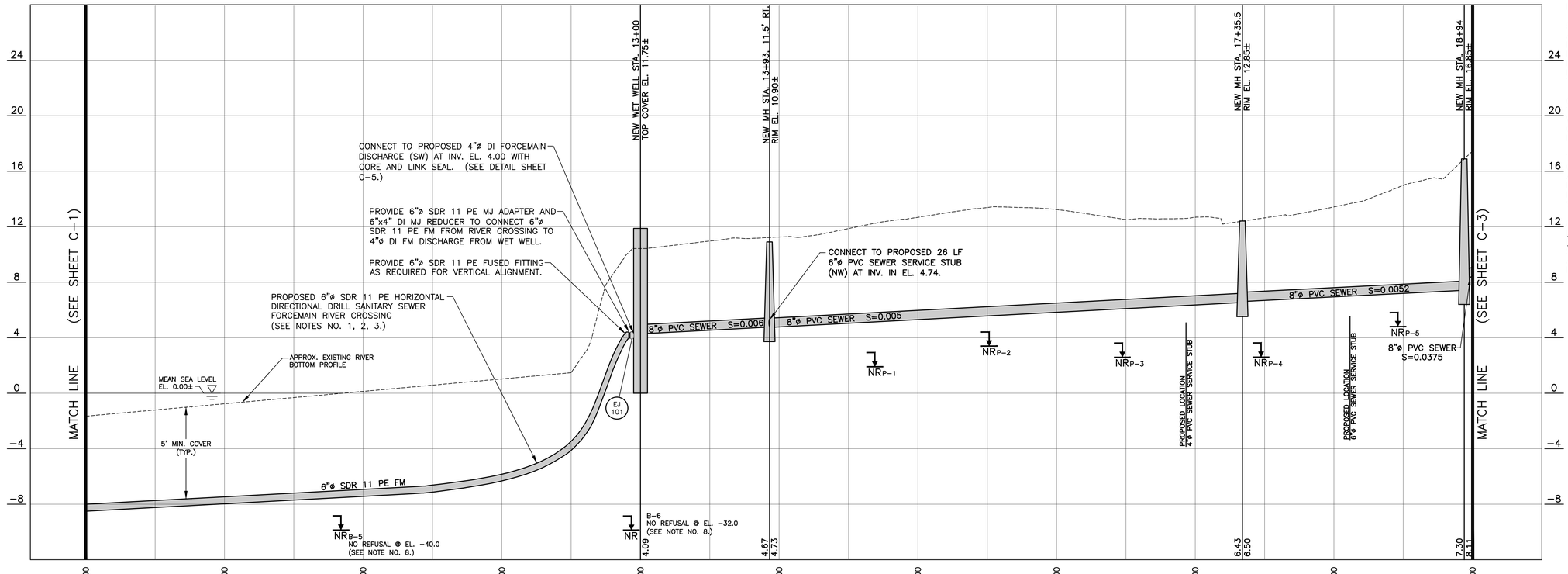
SANITARY SEWER PLAN AND PROFILE

SCALE: AS NOTED | PROJECT NO.: 1300

DATE: JULY, 2012 | SHEET: C-1



PLAN
SCALE: 1"=40'



PROFILE
SCALE: 1"=40' HORIZ.
1"=4' VERT.

NOTES:

1) DESIGN INTENT IS TO LOCATE THE FORCEMAIN AT A TWENTY-FIVE FOOT OFFSET FROM THE TOE OF THE SLOPE THROUGH THE CAUSEWAY AND RIVER CROSSING AREA IN ACCORDANCE WITH THE REQUIREMENTS OF THE MAINE DEPARTMENT OF TRANSPORTATION. THE EXACT LOCATION AND PROFILE OF PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING TO BE DETERMINED BY THE DRILLING CONTRACTOR AND APPROVED BY ENGINEER AND THE MAINE DEPARTMENT OF TRANSPORTATION PRIOR TO BEGINNING WORK.

2) PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING PROFILE SHALL HAVE A MINIMUM FIVE FEET OF COVER ALONG ENTIRE ROUTE.

3) THE PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL SANITARY SEWER FORCEMAIN RIVER CROSSING SHALL BE INSTALLED AND PERMITTED TO STABILIZE TO ACCOUNT FOR PULL-BACK PRIOR TO CONNECTION TO WET WELL FORCEMAIN DISCHARGE PIPING. PROVIDE 6"ø SDR 11 PE BUTT FUSED 45° ELBOW TO DIVERT PUMPED FLOW TOWARD THE 8"ø PVC INVERT OUT OF MH STA 1+98.

4) CONTRACTOR SHALL EXERCISE APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN ACCORDANCE WITH ACCEPTED PRACTICE, APPLICABLE LAWS AND REGULATIONS AND REQUIREMENTS OF THESE CONTRACT DOCUMENTS. SEWER TRENCH ROUTES ARE WITHIN AN AREA OF AN MDOT DRAINAGE DITCH. PROVIDE DAILY MAINTENANCE AND EROSION CONTROL MEASURES AS REQUIRED FOR INSTALLATION OF NEW WORK. PROVIDE ADDITIONAL MULCH, JUTE MAT AND TEMPORARY STONE CHECK DAM AS REQUIRED TO STABILIZE DISTURBED DITCH.

5) LOCATION OF EXISTING UNDERGROUND TELEPHONE IS APPROXIMATE BASED ON AVAILABLE INFORMATION AS PROVIDED BY UTILITY COMPANY. CONDUCT TEST PITS IN ADVANCE WHERE INDICATED TO VERIFY EXACT LOCATION AND ELEVATION. ENGINEER MAY MODIFY DESIGN TO PROVIDE ADDITIONAL HORIZONTAL SEPARATION BETWEEN EXISTING UNDERGROUND TELEPHONE AND PROPOSED SEWER.

6) PROVIDE 2 INCH RIGID INSULATION FULL TRENCH WIDTH THROUGH SEWER SERVICE STUB DRAINAGE DITCH CROSSINGS WHERE LESS THAN FIVE FEET OF COVER. DESIGN INTENT IS TO CROSS EXISTING DRAINAGE DITCHES WITH FOUR FEET OF COVER MINIMUM.

7) NOTIFY MAINE DEPARTMENT OF CONSERVATION PRIOR TO CONDUCTING WORK NEAR GRAVEL TRAIL. PROVIDE TEMPORARY ALTERNATIVE ACCESS AROUND WORK AREA TO TRAIL SYSTEM. REMOVE EXISTING GRAVEL MATERIAL AND SALVAGE FOR REPLACEMENT IN TRAIL. IF INSUFFICIENT MATERIAL CAN BE SALVAGED, MATCH EXISTING MATERIAL PER MDOT REQUIREMENTS.

8) SOURCE OF SOILS BORING INFORMATION ON THIS SHEET IS EXPLORATIONS AND GEOTECHNICAL ENGINEERING SERVICES, PROPOSED EAST SIDE SEWER EXTENSION, MACHIAS, MAINE BY S.W. COLE ENGINEERING INC. DATED MARCH 06, 2012 IN APPENDIX OF SPECIFICATIONS. BORINGS ARE SHOWN OUT OF PHASE AS NOTED BY ELEVATION.

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
LICENSED PROFESSIONAL ENGINEER

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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION
OCT, 2013	RECORD DRAWING
9/2012	REVISED LOCATION MH 14+63

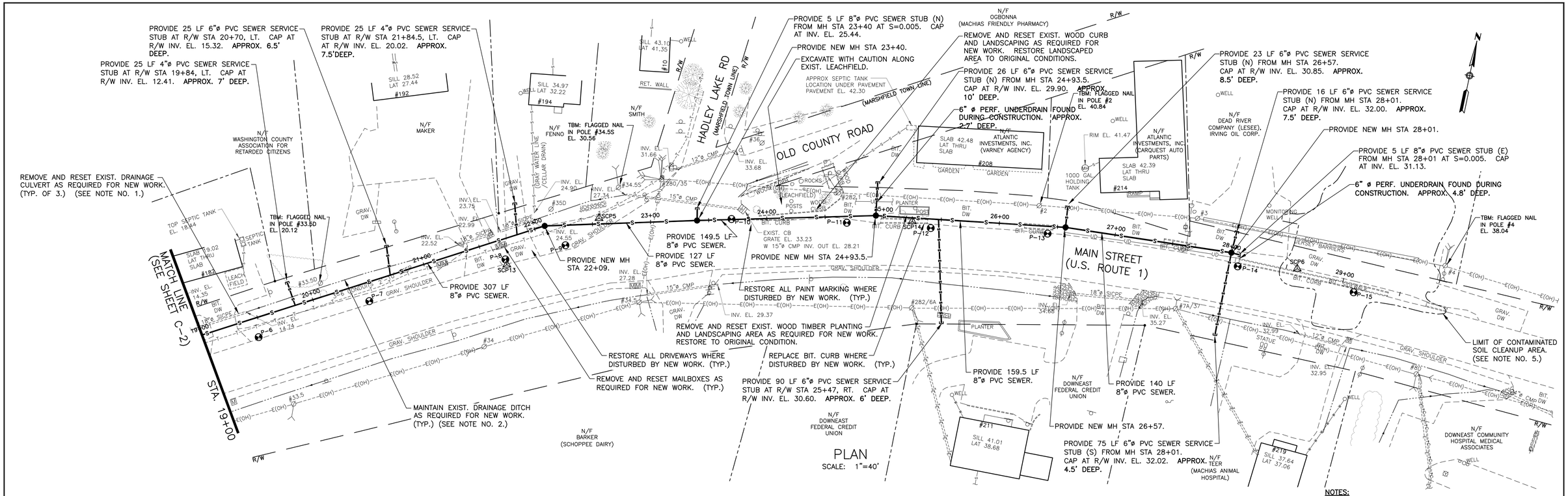
DES.BY: EWH | DR.BY: AWL/NWD | CK.BY: MHO

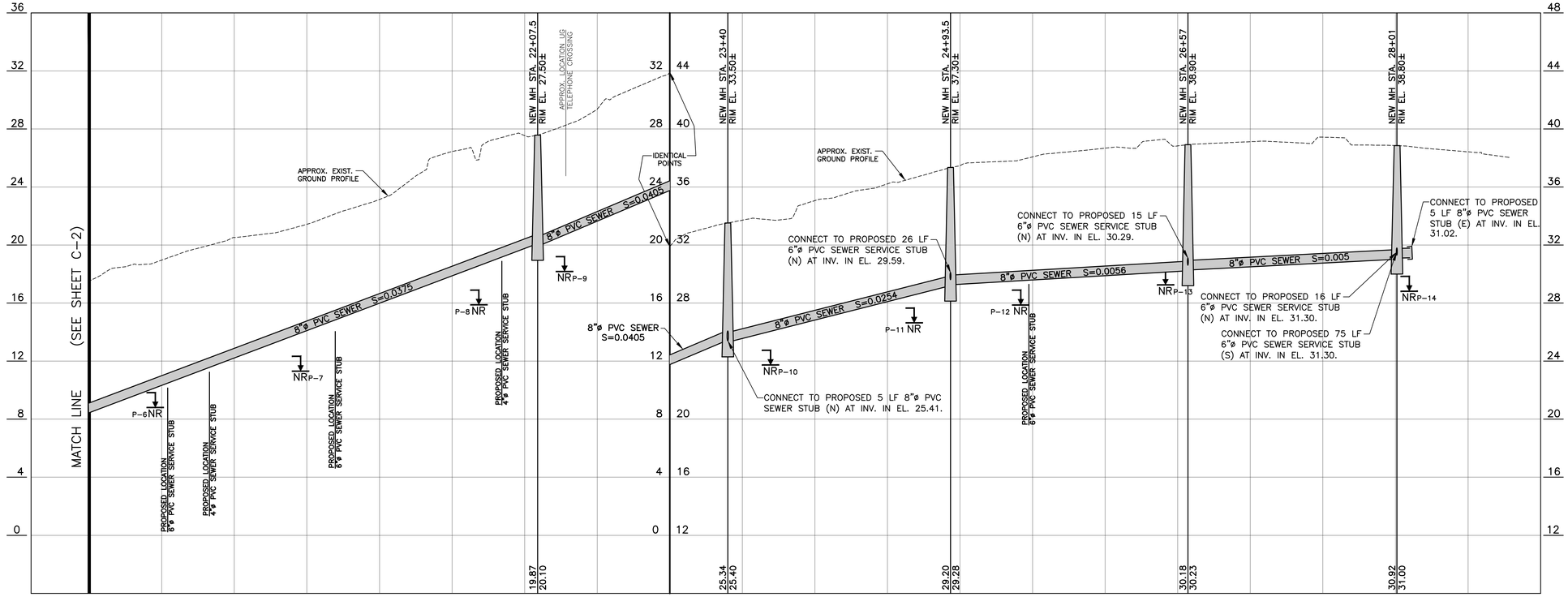
TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION-PHASE 1

SANITARY SEWER PLAN AND PROFILE

SCALE: AS NOTED | PROJECT NO.: 1300
DATE: JULY, 2012 | SHEET: C-2





NOTES:

1) PROVIDE RIP RAP AT CULVERT INLET AND OUTLET IF CULVERTS ARE REMOVED AND RESET AS REQUIRED FOR NEW WORK.

2) CONTRACTOR SHALL EXERCISE APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN ACCORDANCE WITH ACCEPTED PRACTICE, APPLICABLE LAWS AND REGULATIONS AND REQUIREMENTS OF THESE CONTRACT DOCUMENTS. SEWER TRENCH ROUTES ARE WITHIN AN AREA OF A DRAINAGE DITCH. PROVIDE DAILY MAINTENANCE AND EROSION CONTROL MEASURES AS REQUIRED FOR INSTALLATION OF NEW WORK. PROVIDE ADDITIONAL MULCH, JUTE MAT AND TEMPORARY STONE CHECK DAM AS REQUIRED TO STABILIZE DISTURBED DITCH.

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4) PROVIDE 2 INCH RIGID INSULATION FULL TRENCH WIDTH THROUGH SEWER SERVICE STUB DRAINAGE DITCH CROSSINGS WHERE LESS THAN FIVE FEET OF COVER. DESIGN INTENT IS FOR PROPOSED SEWER STUBS TO CROSS EXISTING DRAINAGE DITCHES WITH FOUR FEET OF COVER MINIMUM.

5) LOCATION OF CONTAMINATED SOIL CLEANUP AREA FROM FIGURE 2: SOIL EXCAVATION AREA FORMER DW SMALL FACILITY US ROUTE ONE, MACHIAS, MAINE BY ACADIA ENVIRONMENTAL TECHNOLOGY.

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
LICENSED PROFESSIONAL ENGINEER

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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION
OCT, 2013	RECORD DRAWING

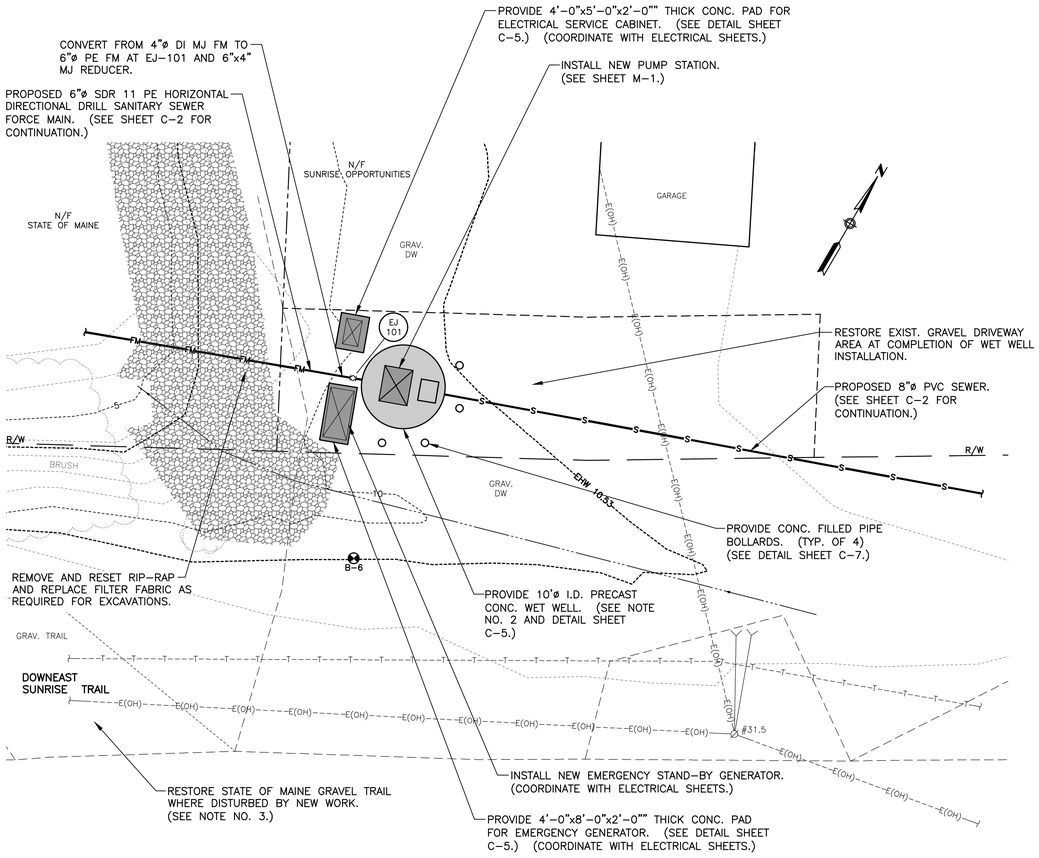
DES.BY:	DR.BY:	CK.BY:
EWH	AWL/NWD	MHO

TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION–PHASE 1

SANITARY SEWER PLAN AND PROFILE

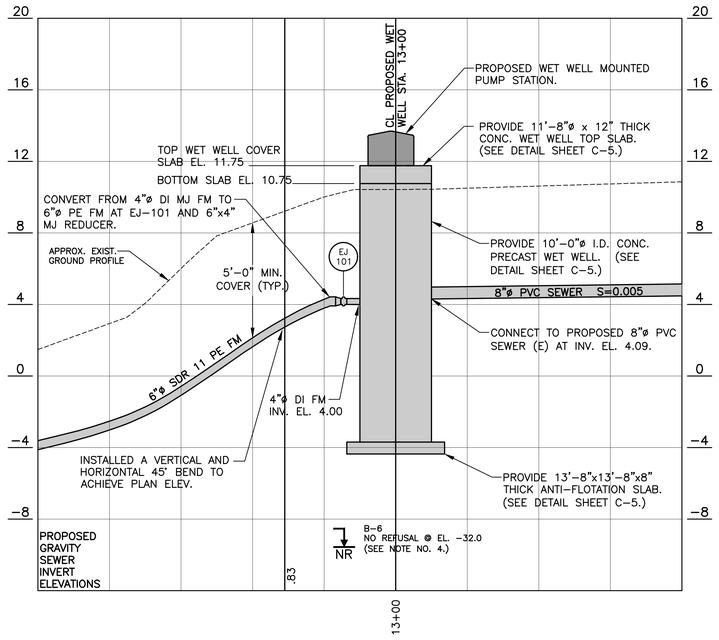
SCALE:	AS NOTED	PROJECT NO.:	1300
DATE:	JULY, 2012	SHEET:	C–3



MAIN STREET (U.S. ROUTE 1)

PUMP STATION SITE PLAN

SCALE: 1" = 10'-0"



PUMP STATION PROFILE

SCALE: 1" = 10'-0" HORIZ.
1" = 4'-0" VERT.

NOTES:

1) COORDINATE ALL SITE WORK WITH MECHANICAL AND ELECTRICAL SHEETS.

2) PROPOSED 6"ø SDR 11 PE HORIZONTAL DIRECTIONAL DRILL FORCE MAIN RIVER CROSSING SHALL BE COMPLETED PRIOR TO INSTALLATION OF WET WELL STA. 13+00.

3) NOTIFY MAINE DEPARTMENT OF CONSERVATION PRIOR TO CONDUCTING WORK NEAR GRAVEL TRAIL. PROVIDE TEMPORARY ALTERNATIVE ACCESS AROUND WORK AREA TO TRAIL SYSTEM. REMOVE EXISTING GRAVEL MATERIAL AND SALVAGE FOR REPLACEMENT IN TRAIL. IF INSUFFICIENT MATERIAL CAN BE SALVAGED, MATCH EXISTING MATERIAL PER MDOT REQUIREMENTS.

4) SOURCE OF SOILS BORING INFORMATION ON THIS SHEET IS EXPLORATIONS AND GEOTECHNICAL ENGINEERING SERVICES, PROPOSED EAST SIDE SEWER EXTENSION, MACHIAS, MAINE BY S.W. COLE ENGINEERING INC. DATED MARCH 06, 2012 IN APPENDIX OF SPECIFICATIONS. BORINGS ARE SHOWN OUT OF PHASE AS NOTED BY ELEVATION.

STATE OF MAINE
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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

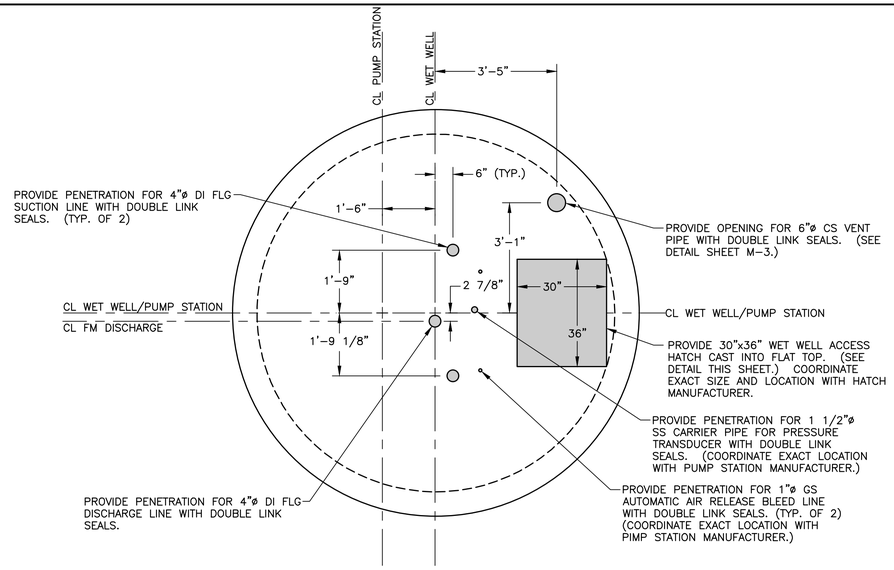
DES.BY: EWH	DR.BY: AWL/NWD	CK.BY: MHO

TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION-PHASE 1

PUMP STATION SITE PLAN AND PROFILE

SCALE: AS NOTED	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: C-4



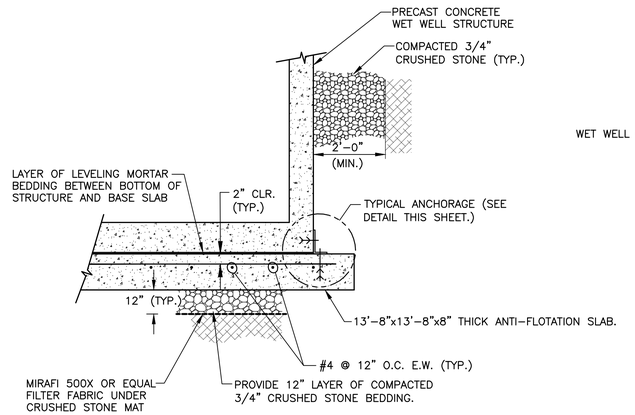
PUMP STATION WET WELL FLAT TOP CORING DETAIL

NOTES:

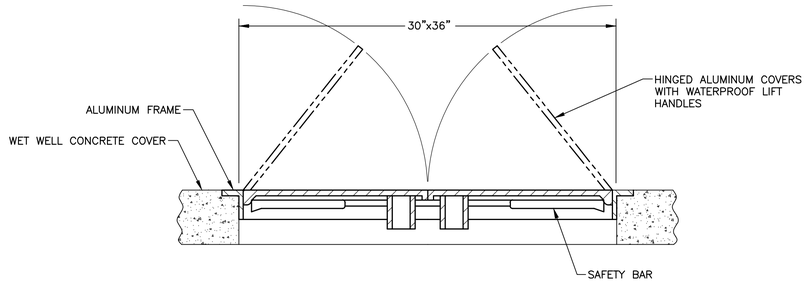
1) CORE ALL OPENINGS FOR SERVICE LINES AND LINK SEALS.

2) COORDINATE EXACT SIZE AND LOCATION WITH PUMP STATION MANUFACTURER.

3) DOUBLE LINK SEAL FOR GAS-TIGHT FIT.



ANTI-FLOTATION SLAB

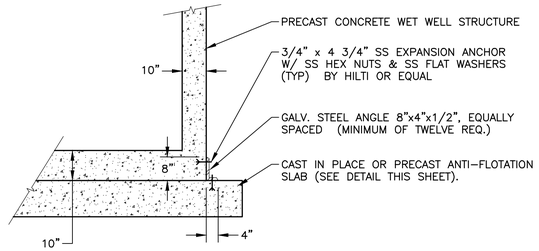


WET WELL ACCESS COVER DETAIL

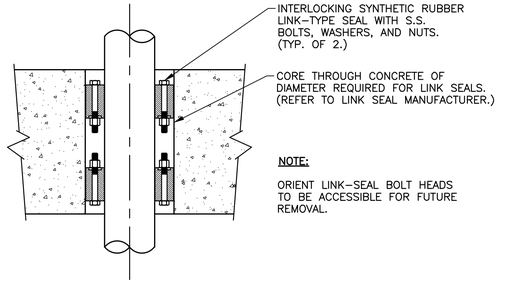
NOTES:

1) PROVIDE 30" X 36" HEAVY DUTY ALUMINUM FRAME AND HINGED DOUBLE LID, WITH TOP HASP AND NON-SPARK HARDWARE, SAFETY BAR AND COUNTER-SUNK BOLTS. NEENAH MODEL R-6663-MH OR EQUAL

2) PROVIDE SAFETY NET BELOW ACCESS HATCH.



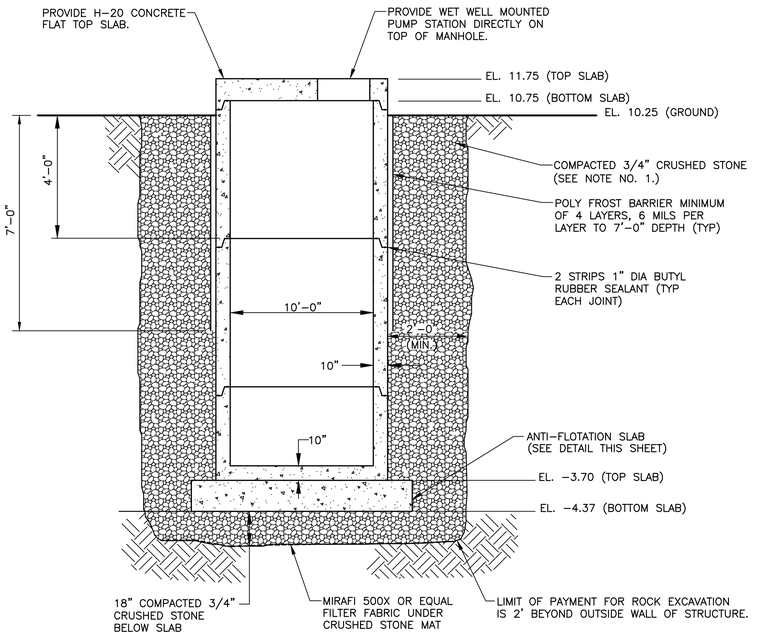
TYPICAL ANCHORAGE DETAIL



NOTE:

ORIENT LINK-SEAL BOLT HEADS TO BE ACCESSIBLE FOR FUTURE REMOVAL.

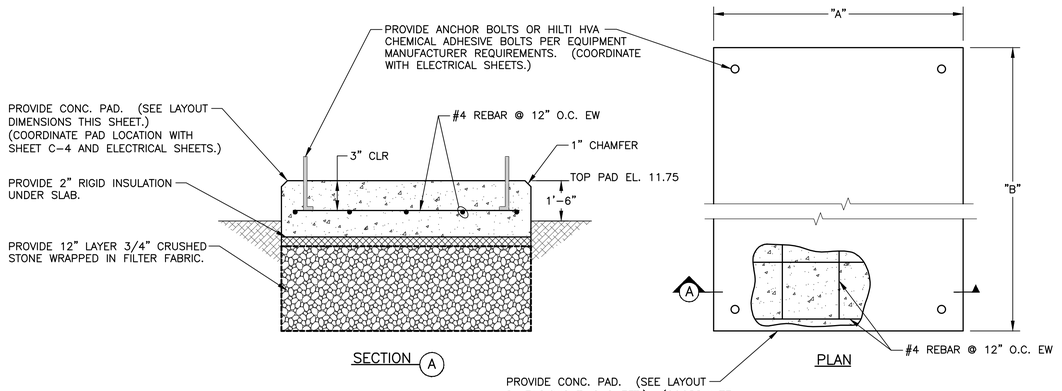
TYPICAL CORE AND LINK SEAL PIPE PENETRATION DETAIL



PRECAST WET WELL DETAIL

NOTE:

CRUSHED STONE BACKFILL WILL BE REQUIRED FOR THIS SITE. ALTERNATE BACKFILLS WILL NOT BE CONSIDERED.



PAD LAYOUT DIMENSIONS

EQUIPMENT	QUANTITY	A	B	C
EMERGENCY STAND-BY GENERATOR	1	48"	96"	24"
ELECTRICAL SERVICE CABINET	1	48"	60"	24"

EQUIPMENT PAD DETAIL

STATE OF MAINE
MANDY HOLWAY OLVER
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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

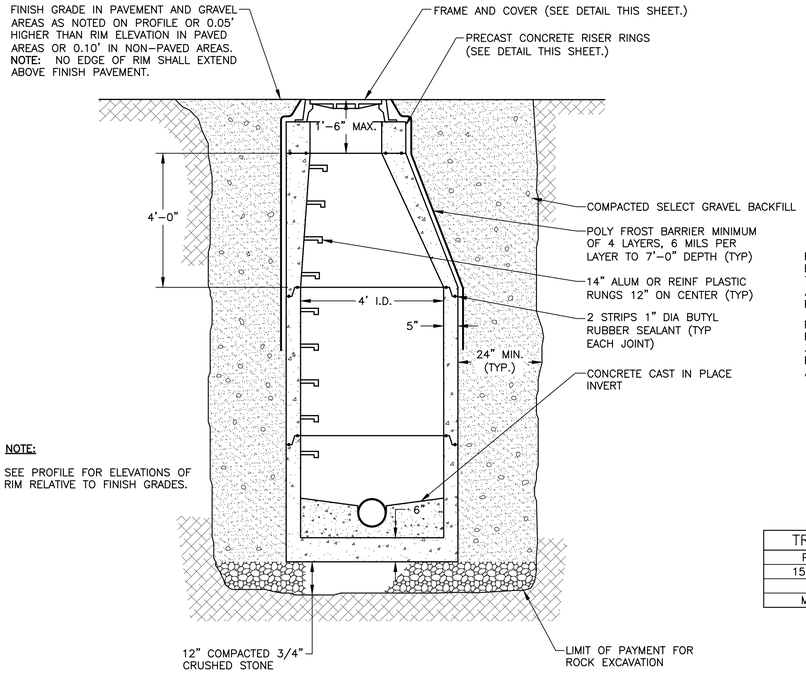
DES.BY:	EWH	DR.BY:	NWD	CK.BY:	MHO

TOWN OF MACHIAS, MAINE

EAST SIDE SEWER EXTENSION-PHASE 1

CIVIL DETAILS

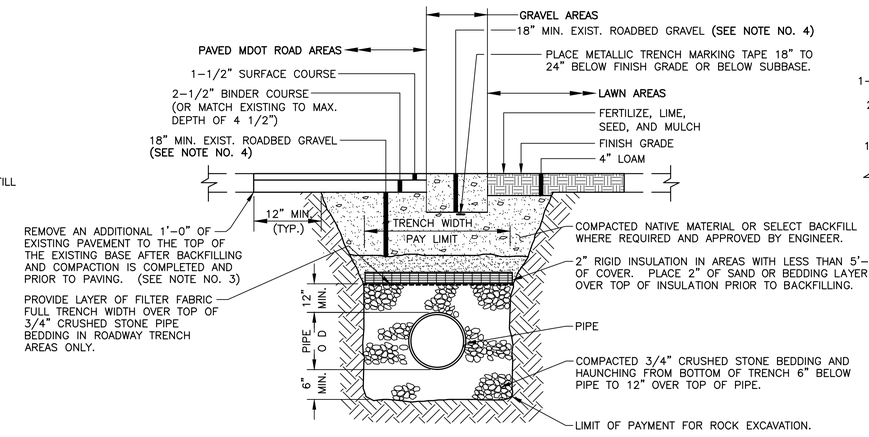
SCALE:	NONE	PROJECT NO.:	1300
DATE:	JULY, 2012	SHEET:	C-5



NOTE:

SEE PROFILE FOR ELEVATIONS OF RIM RELATIVE TO FINISH GRADES.

PRECAST MANHOLE DETAIL



TYPICAL MDOT SEWER TRENCH DETAIL

TRENCH WIDTHS/PAY LIMIT	
PIPE SIZE	MAX
15" OR LESS	4'-0"
18"	5'-0"
MANHOLES	OD + 4'-0"

NOTES:

1) THIS DETAIL APPLIES TO ALL SEWER TRENCHES ON MDOT ROADS.

2) MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.

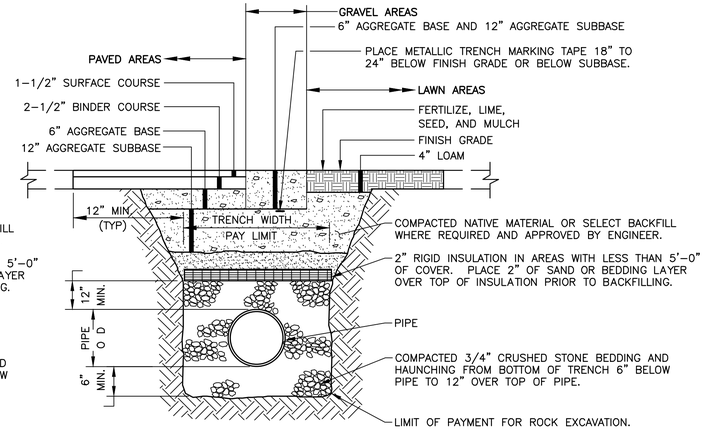
3) THE FINAL SAW CUTTING OF PAVEMENT TO THE TOP OF THE EXISTING BASE SHALL BE PERFORMED AFTER BACKFILLING AND COMPACTION IS COMPLETE. AFTER SAW CUTTING AND REMOVING AN ADDITIONAL 12" MIN. OF PAVEMENT BEYOND EACH EDGE OF THE TRENCH, THE ENTIRE EXPOSED GRAVEL LAYER SHALL BE ONCE AGAIN COMPACTED, INCLUDING THE UNDISTURBED GRAVEL PORTION, PRIOR TO PAVING.

4) DURING EXCAVATION, SEPARATE THE EXISTING ROADBED GRAVEL LAYER FROM THE NATIVE TRENCH EXCAVATION BELOW. REUSE ORIGINAL EXCAVATED NATIVE MATERIALS DURING BACKFILLING IF COMPACTABLE IN THE ORDER THAT THEY WERE REMOVED. THE DESIGN INTENT IS TO MATCH THE EXISTING ROADWAY BASE/SUBBASE DEPTH AND TO PROVIDE A MINIMUM DEPTH OF 18" FOR WHEEL LOAD DISTRIBUTION TO THE SUBGRADE. IF EXISTING ROADWAY BASE/SUBBASE DEPTHS ARE ARE LESS THAN 18", CONTRACTOR SHALL CONSULT WITH ENGINEER BEFORE PROCEEDING. INTENT IS TO MATCH EXISTING CONDITIONS AS CLOSE AS POSSIBLE.

5) TRENCH PAVEMENT PAY LIMIT IS 8'-0". MANHOLE PAVEMENT PAY LIMIT IS 11'-0" SQUARE.

6) MATCH EXISTING PAVEMENT THICKNESS TO A MAXIMUM OF 6" TOTAL PAVEMENT DEPTH. IF PAVEMENT DEPTH EXCEEDS 6", BACKFILL BETWEEN TOP OF BASE AND BOTTOM OF PAVEMENT WITH GRAVEL BASE OR GRINDINGS.

7) THIS DETAIL APPLIES TO ALL AREAS EXCEPT AS NOTED.



TYPICAL NON-MDOT SEWER TRENCH DETAIL

TRENCH WIDTHS/PAY LIMIT	
PIPE SIZE	MAX
15" OR LESS	4'-0"
18"	5'-0"
MANHOLES	OD + 4'-0"

NOTES:

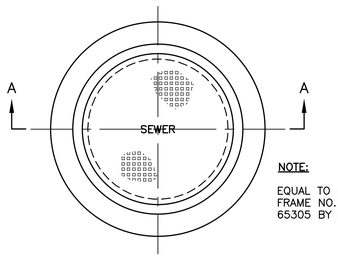
1) THE PARKING LOT AREA FOR N/F SUNRISE OPPORTUNITIES (#168 MAIN STREET) AND THE SEWER TRENCH FROM STA. 14+00± TO STA. 17+00± SHALL BE RESTORED WITH 4" PAVEMENT AS NOTED ON THIS DETAIL.

2) THE BITUMINOUS DRIVEWAY AREA AND SEWER TRENCH FROM STA. 24+00± TO MH STA. 28+01± SHALL BE RESTORED WITH 4" PAVEMENT AS NOTED ON THIS DETAIL.

3) MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.

4) FOR DRIVEWAY AREAS OTHER THAN AS NOTED IN NOTE NO. 2, PROVIDE 1-1/4" SURFACE COURSE AND 1-1/4" BINDER COURSE.

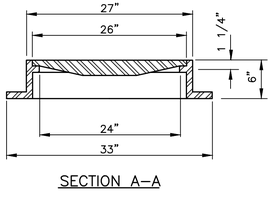
5) TRENCH PAVEMENT PAY LIMIT IS TRENCH WIDTH PLUS 2'-0".



NOTE:

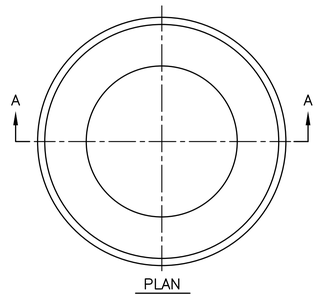
EQUAL TO EAST JORDAN IRON WORKS FRAME NO. 65058 AND COVER NO. 65305 BY E.J. PRESCOTT, INC.

PLAN

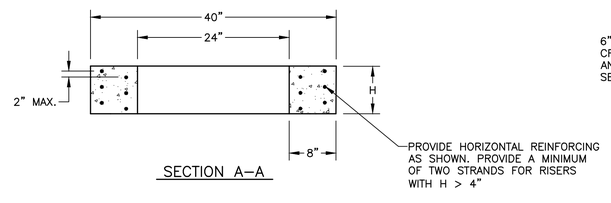


SECTION A-A

MANHOLE FRAME AND COVER DETAIL



PLAN



SECTION A-A

PRECAST CONCRETE GRADE RINGS DETAIL

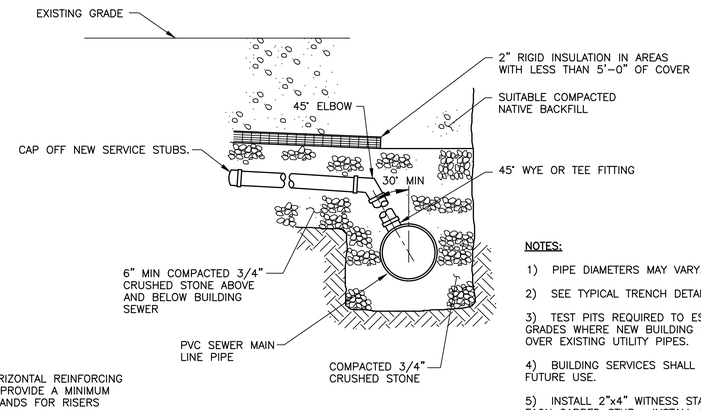
NOTES:

1) PROVIDE H OF 4" MIN. TO 9" MAX. AS REQUIRED TO BRING FRAME TO FINAL GRADE.

2) FOR FRAME ADJUSTMENTS OF LESS THAN 4" USE APPROVED ALTERNATE HEIGHT FRAME AND ATTACH DIRECTLY TO PRECAST STRUCTURE CONE.

3) DO NOT MAKE FINAL ADJUSTMENT OF RIM ELEVATION UNTIL AFTER BINDER PAVEMENT COURSE HAS BEEN PLACED IN PAVED AREAS.

4) SET RIM ELEVATION 0.05' BELOW FINAL SURFACE COURSE ELEVATION IN PAVED AREAS AND 0.1' BELOW FINAL SURFACE ELEVATION IN NON-PAVED AREAS.



NOTES:

1) PIPE DIAMETERS MAY VARY.

2) SEE TYPICAL TRENCH DETAIL FOR NOTES.

3) TEST PITS REQUIRED TO ESTABLISH FINAL GRADES WHERE NEW BUILDING SEWER CROSSES OVER EXISTING UTILITY PIPES.

4) BUILDING SERVICES SHALL BE CAPPED FOR FUTURE USE.

5) INSTALL 2"x4" WITNESS STAKES AT END OF EACH CAPPED STUB. INSTALL STEEL BAND ON PIPE AT END OF STUB NEAR CAP TO FACILITATE FUTURE LOCATION OF STUBS.

BUILDING SEWER CONNECTION DETAIL

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

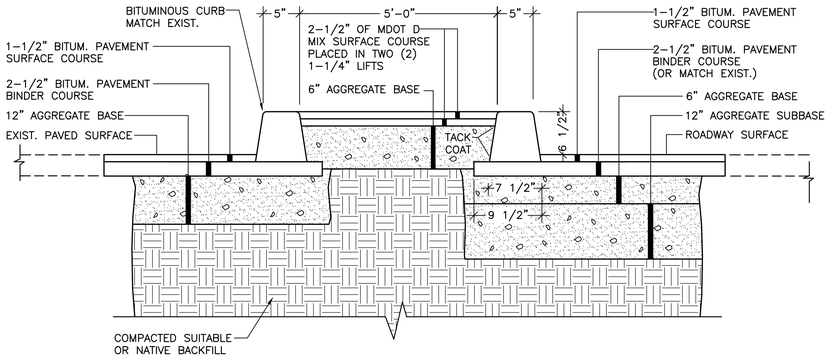
DES.BY: EWH	DR.BY: NWD	CK.BY: MHO

TOWN OF MACHIAS, MAINE

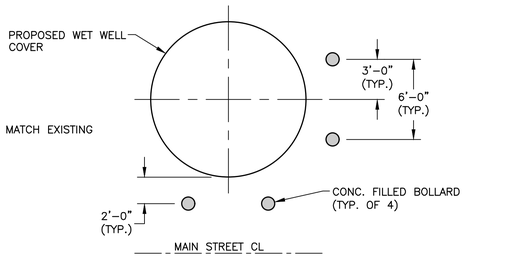
EAST SIDE SEWER EXTENSION-PHASE 1

CIVIL DETAILS

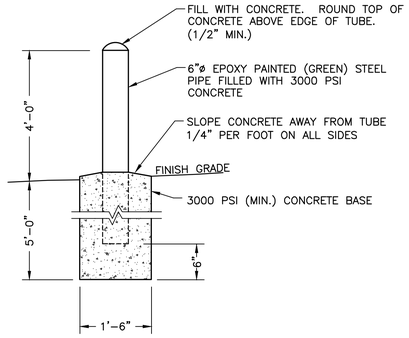
SCALE: NONE	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: C-6



ESPLANADE SIDEWALK DETAIL

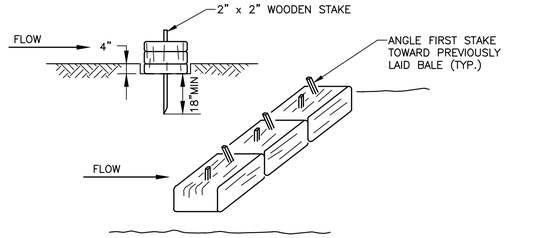


PLAN LAYOUT

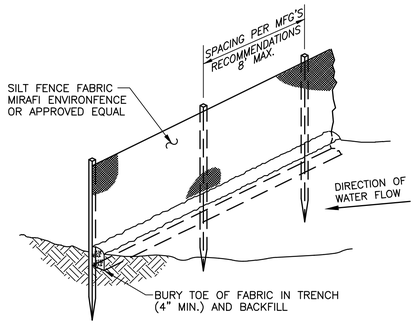


SECTION

CONCRETE FILLED PIPE BOLLARD DETAIL



HAY BALE BARRIER DETAIL



SILT FENCE DETAIL

EROSION CONTROL NOTES

EROSION CONTROL DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE CARRIED OUT UTILIZING THE FOLLOWING MEASURES AND IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION.

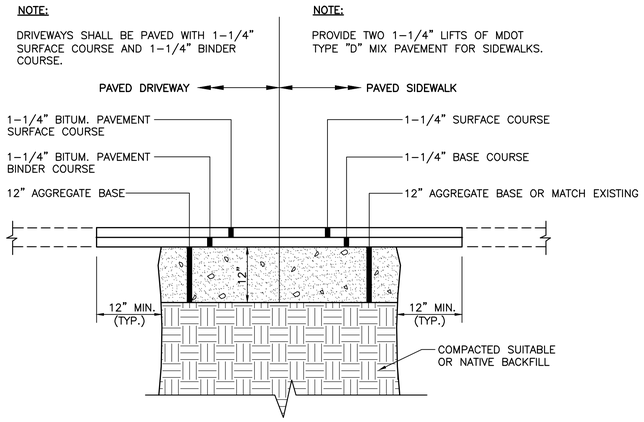
1. HAY BALES AND/OR SILT FENCES SHALL BE INSTALLED AS SHOWN ON THIS PLAN AND ON THE "DOWNSTREAM" SLOPE OF ALL CONSTRUCTION AREAS PRIOR TO THE START OF CONSTRUCTION IN THAT AREA. UTILIZE HAY BALES AS NECESSARY TO RESTRICT SOIL TRANSPORT DURING DITCH RESHAPING. TEMPORARY EROSION CONTROL BARRIERS SHALL BE MAINTAINED UNTIL PERMANENT GROUND PROTECTION IS ESTABLISHED.
2. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED IN SUCH A MANNER THAT THE LEAST PRACTICAL AMOUNT OF SOIL IS DISTURBED THAT CANNOT HAVE PERMANENT EROSION CONTROL MEASURES APPLIED IMMEDIATELY.
3. ALL DISTURBED SURFACES SHALL BE LOAMED AND SEEDED IMMEDIATELY AFTER FINAL GRADING IS COMPLETED.
4. ALL DISTURBED SURFACES NOT BEING FINAL GRADED SHALL BE MULCHED WITH HAY OR STRAW AT 46 LBS. PER 1000 SQ. FT. (2 TONS PER ACRE) OR STABILIZED WITH EROSION CONTROL MAT (ANTI-WASH/GEOJUTE OR EQUAL).
5. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES AFTER EVERY RAINFALL OR A MINIMUM OF ONCE A WEEK AND PERFORM ANY NECESSARY MAINTENANCE OF THESE MEASURES. MAINTENANCE PROCEDURES FOR EROSION CONTROL MEASURES INCLUDE:
   - A. REPAIRING ANY BARRIERS WHICH HAVE BECOME INEFFECTIVE OR DISLODGED.
   - B. REPLACING ANY BARRIER WHICH HAS DETERIORATED OR BECOME INEFFECTIVE.
   - C. REMOVING SEDIMENT DEPOSITS FROM THE BARRIERS WHEN THE DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

NOTE:

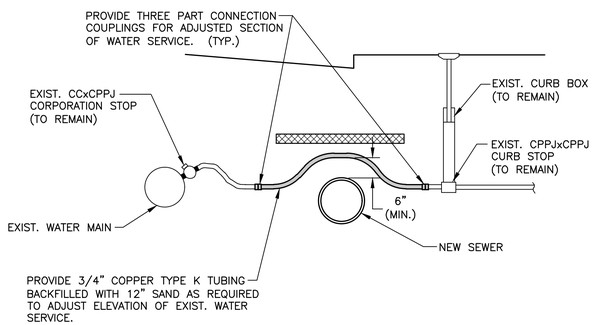
DRIVEWAYS SHALL BE PAVED WITH 1-1/4" SURFACE COURSE AND 1-1/4" BINDER COURSE.

NOTE:

PROVIDE TWO 1-1/4" LIFTS OF MDOT TYPE "D" MIX PAVEMENT FOR SIDEWALKS.



TYPICAL BITUMINOUS DRIVEWAY AND SIDEWALK REPAIR DETAIL



WATER SERVICE RELOCATION DETAIL

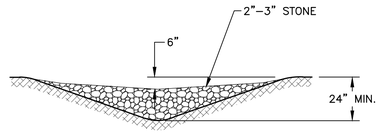
NOTES:

1) PROVIDE 2" RIGID INSULATION WHERE LESS THAN 5' OF COVER EXISTS OVER WATER SERVICE RELOCATION.

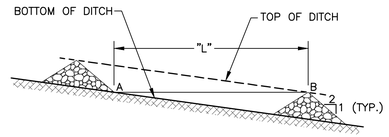
2) THIS DETAIL APPLIES TO ALL WATER SERVICE RELOCATIONS WHERE REQUIRED ON THIS PROJECT.

3) PAYMENT WILL BE MADE ONLY FOR WATER SERVICE CONNECTIONS THAT REPRESENT DIRECT ON-GRADE CONFLICTS WITH NEW SEWER. ALL OTHER REPAIRS REMAIN THE CONTRACTOR'S RESPONSIBILITY.

4) BED WATER PIPE IN 12" SAND TO PROTECT PIPE.



DITCH SECTION



"L" = DISTANCE BETWEEN CHECK DAMS.
ELEV. "A" = ELEV. "B"

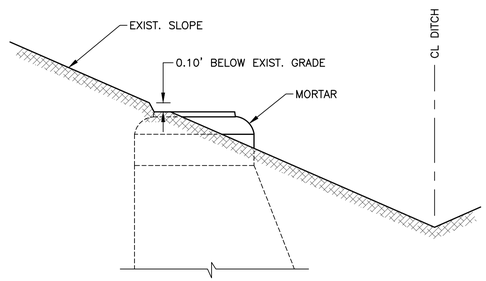
DITCH PROFILE

NOTE:

STONE CHECK DAM SHALL BE REMOVED WHEN GRASS IN DITCH IS FULLY MATURED AND ESTABLISHED TO PROTECT DITCH. THE AREA BENEATH CHECK DAM SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER DAM REMOVAL.

DITCH SLOPE (FT/FT)	"L" (FT)
0.020	100
0.030	66
0.040	50
0.050	40

TEMPORARY STONE CHECK DAM DETAIL



NOTE:

MANHOLE RIM SHALL BE SET 0.10' BELOW FINISH GRADE ON HIGH SIDE OF DITCH INSLOPE.

DITCH SIDESLOPE MANHOLE RIM ELEVATIONS

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

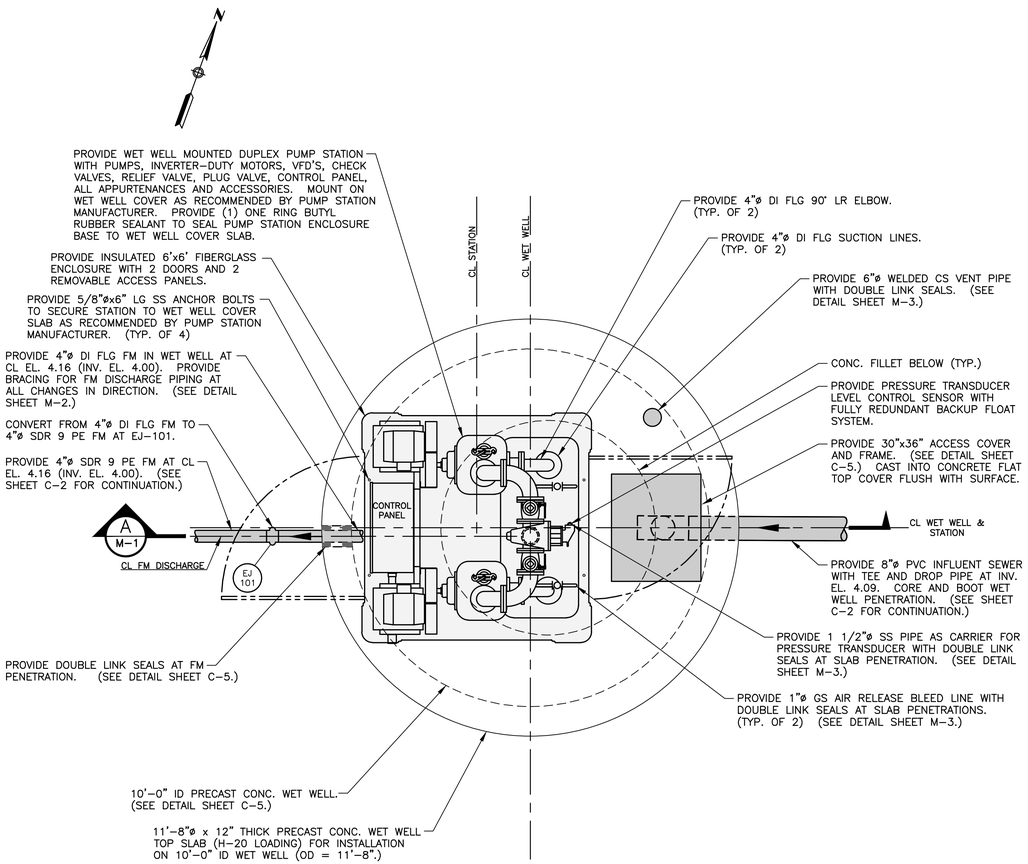
DES.BY: EWH	DR.BY: NWD	CK.BY: MHO

TOWN OF MACHIAS, MAINE

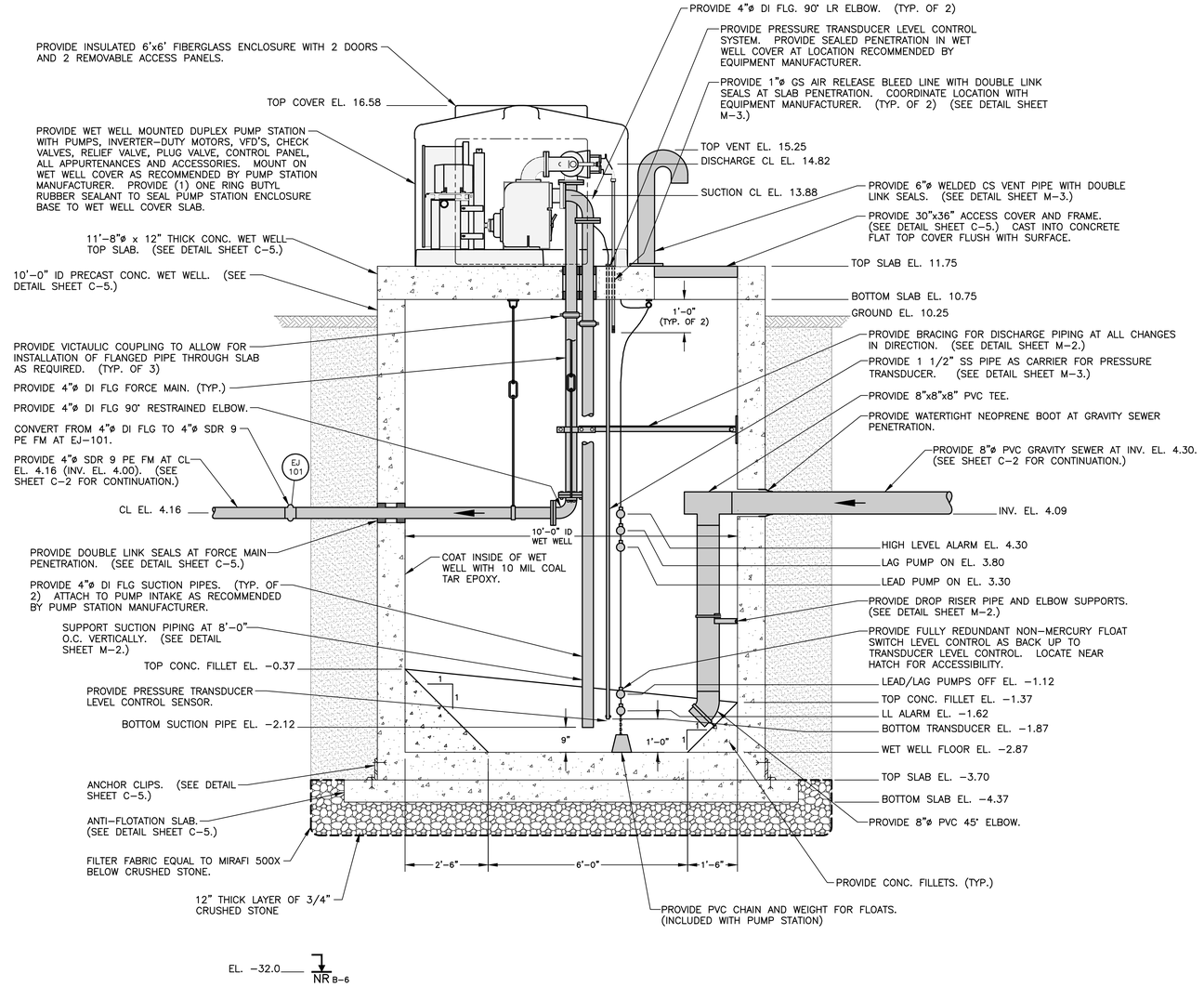
EAST SIDE SEWER EXTENSION-PHASE 1

CIVIL DETAILS

SCALE: NONE	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: C-7



PUMP STATION MECHANICAL PLAN



A M-1 PUMP STATION MECHANICAL SECTION

NOTES:

1) LAY OUT NEW EQUIPMENT LOCATIONS IN FIELD WITH ENGINEER.

2) COORDINATE ALL WORK WITH CIVIL AND ELECTRICAL SHEETS.

3) SOME ELEMENTS IN SECTION VIEW ARE SHOWN OUT OF PHASE FOR CLARITY.

4) ALL PIPING PENETRATIONS THROUGH WET WELL SHALL BE CORED AND DOUBLE LINK SEALED FOR GAS-TIGHT CONNECTION.

5) FORCE MAIN DISCHARGE PIPING SHALL BE SECURED AS SHOWN ON DETAIL SHEET M-2.

6) AFTER ANCHOR BOLTS, PIPING, AND CONTROL CONNECTIONS ARE INSTALLED, COMPLETELY FILL THE GROUT DAM ON THE PUMP STATION BASE WITH NON-SHRINK GROUT.

STATE OF MAINE
MANDY HOLWAY OLVER
No. 5765
LICENSED PROFESSIONAL ENGINEER

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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

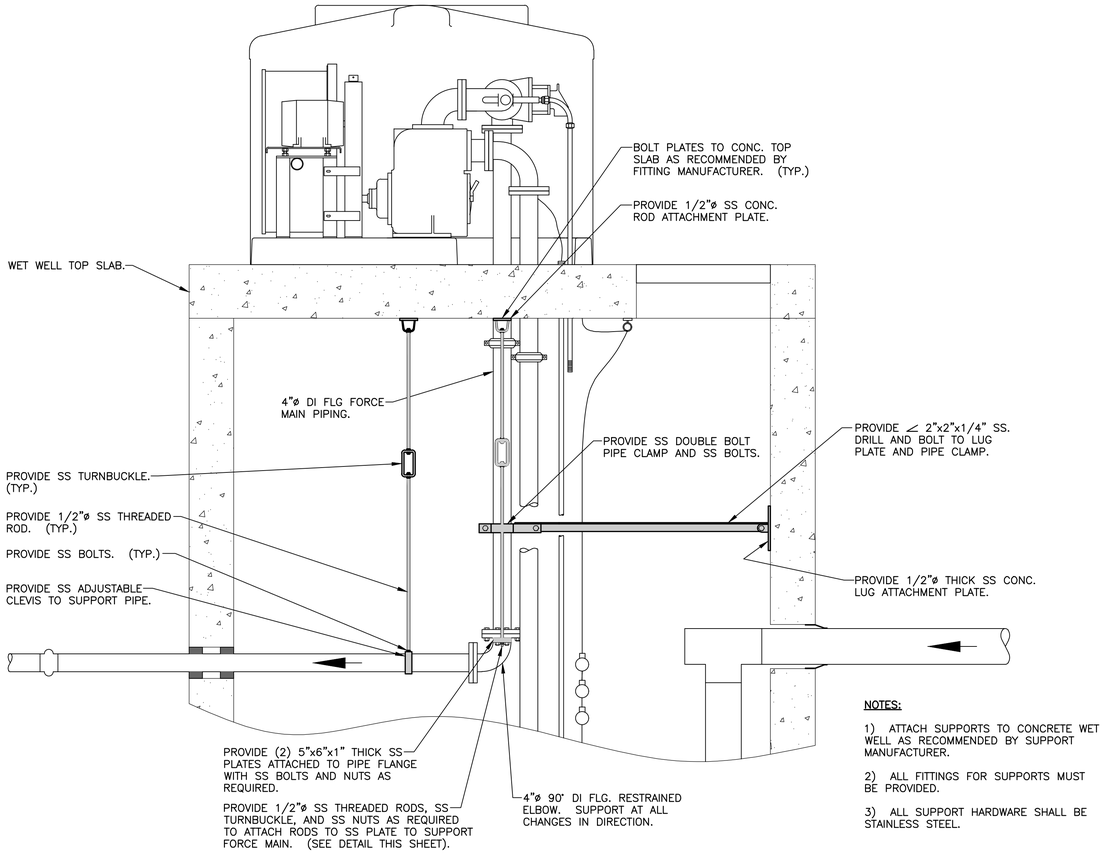
DES.BY: EWH	DR.BY: NWD	CK.BY: MHO

TOWN OF MACHIAS

EAST SIDE SEWER EXTENSION-PHASE 1

PUMP STATION MECHANICAL PLAN AND SECTION

SCALE: 1/2" = 1'-0"	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: M-1



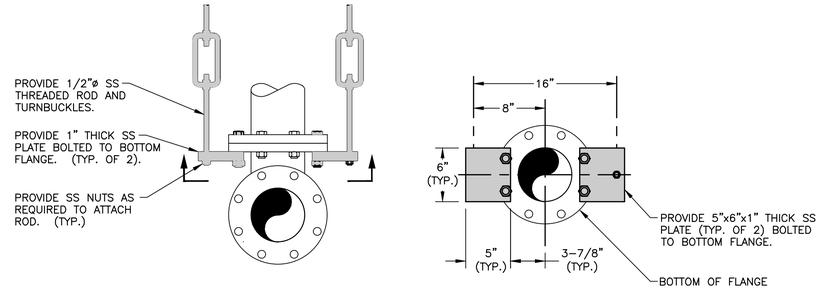
FORCE MAIN SUPPORT DETAIL

NOTES:

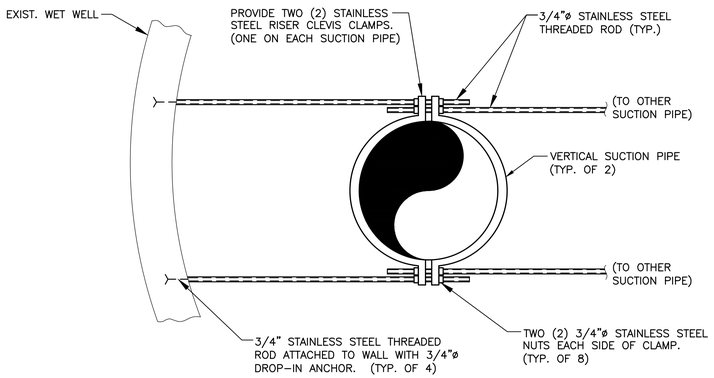
1) ATTACH SUPPORTS TO CONCRETE WET WELL AS RECOMMENDED BY SUPPORT MANUFACTURER.

2) ALL FITTINGS FOR SUPPORTS MUST BE PROVIDED.

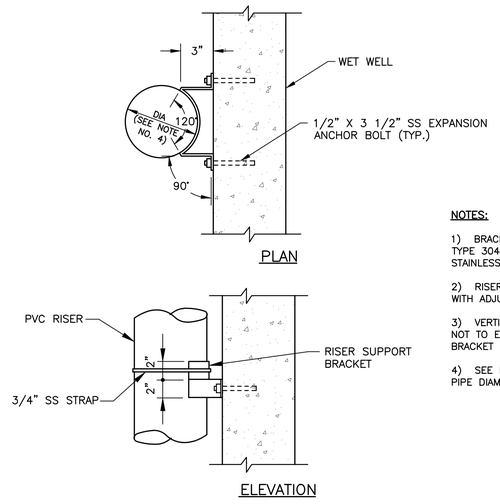
3) ALL SUPPORT HARDWARE SHALL BE STAINLESS STEEL.



FORCE MAIN ELBOW AND VICTAULIC COUPLING SUPPORT DETAIL



SUCTION LINE SUPPORT DETAIL



RISER SUPPORT BRACKET DETAIL

NOTES:

1) BRACKET SHALL BE FABRICATED FROM TYPE 304, 10 GAUGE, NO 3 FINISH STAINLESS STEEL.

2) RISER SHALL BE FASTENED TO BRACKET WITH ADJUSTABLE SS STRAPS.

3) VERTICAL SPACING OF RISER SUPPORTS NOT TO EXCEED 6' WITH A MINIMUM OF ONE BRACKET & STRAP PER DROP.

4) SEE PLAN AND PROFILE SHEETS FOR PIPE DIAMETER.

STATE OF MAINE — MANDY HOLWAY OLVER No. 5765 — REGISTERED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

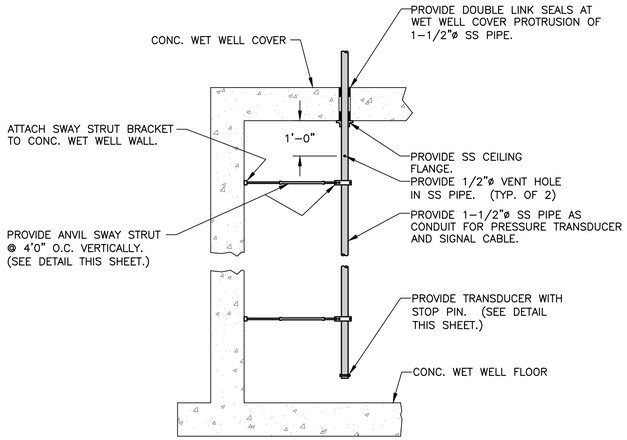
DES.BY:	DR.BY:	CK.BY:
EWH	NWD	MHO

TOWN OF MACHIAS, MAINE

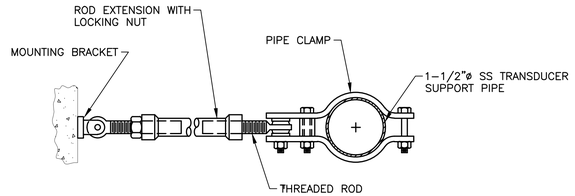
EAST SIDE SEWER EXTENSION–PHASE 1

MECHANICAL DETAILS

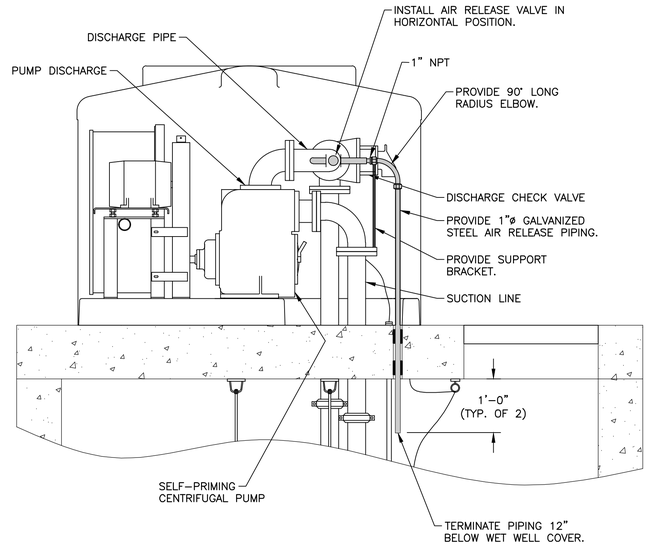
SCALE: NONE	PROJECT NO.: 1300
DATE: JULY, 2012	SHEET: M–2



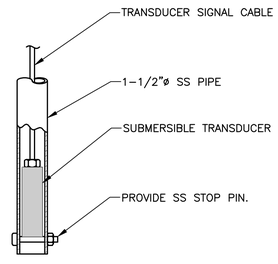
TRANSDUCER RISER SUPPORT DETAIL



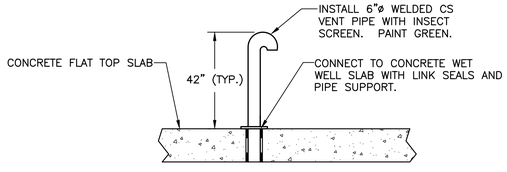
TRANSDUCER SUPPORT PIPE SWAY STRUT ASSEMBLY DETAIL



MANUAL AIR RELEASE BLEED LINE INSTALLATION DETAIL



TRANSDUCER INSTALLATION DETAIL



WET WELL VENT DETAIL

STATE OF MAINE — MANDY HOLWAY OLVER No. 5765 — LICENSED PROFESSIONAL ENGINEER

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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

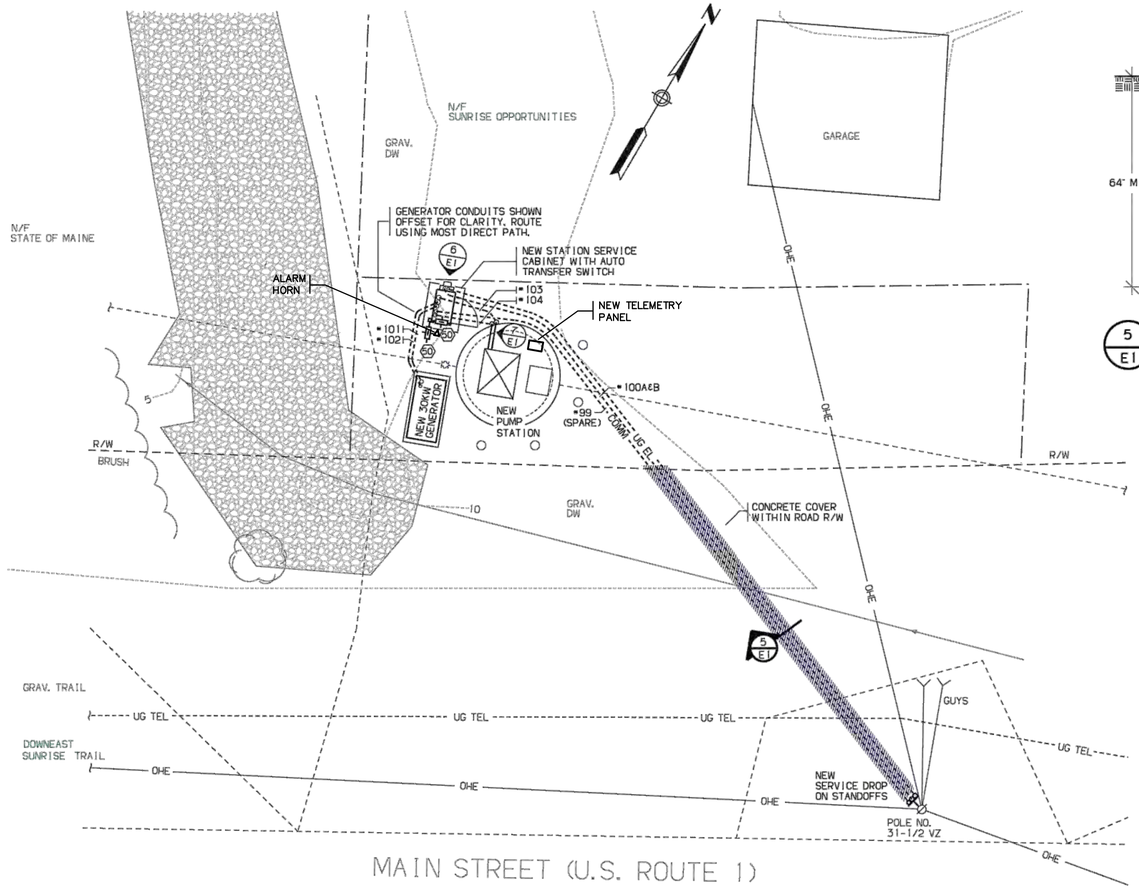
DES.BY:	EWH	DR.BY:	NWD	CK.BY:	MHO

TOWN OF MACHIAS, MAINE

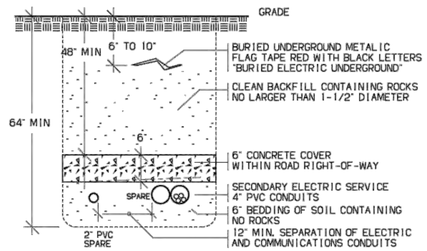
EAST SIDE SEWER EXTENSION–PHASE 1

MECHANICAL DETAILS

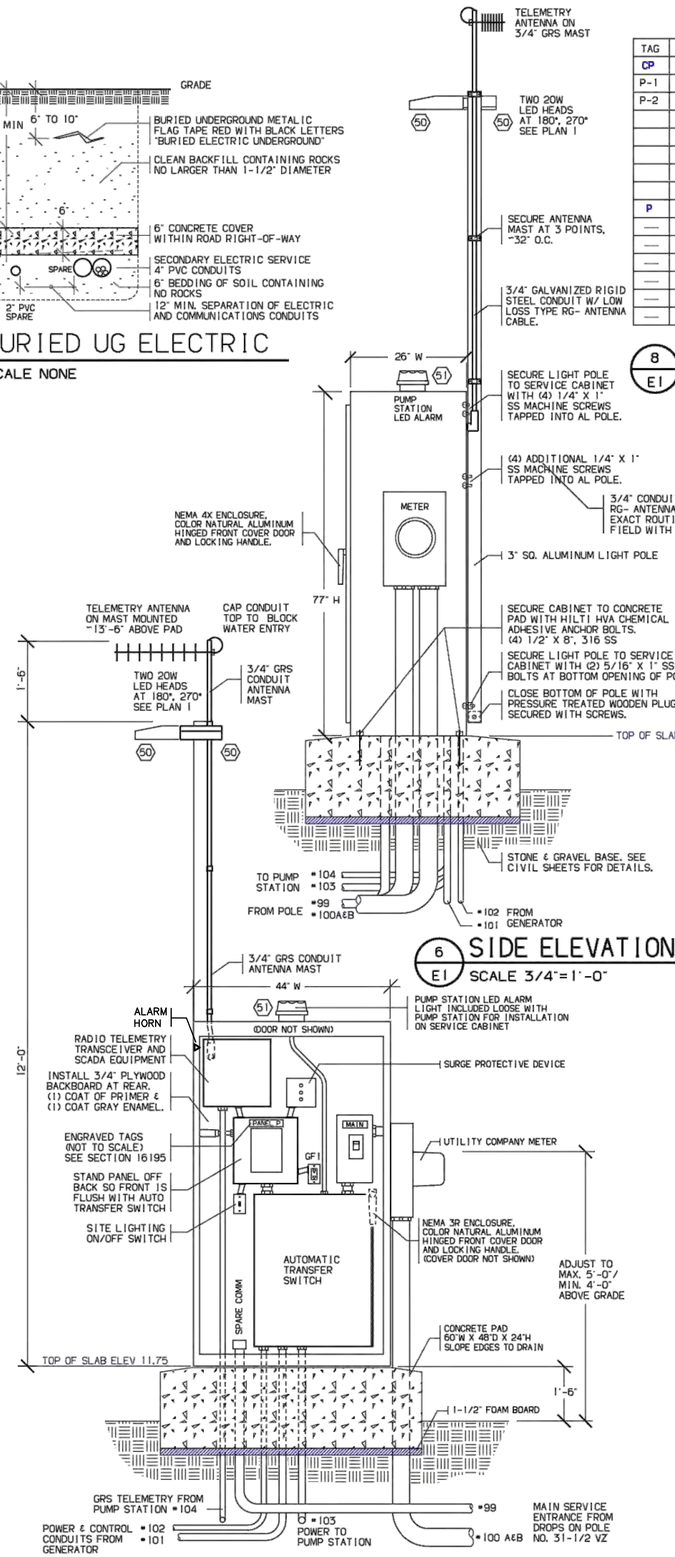
SCALE:	NONE	PROJECT NO.:	1300
DATE:	JULY, 2012	SHEET:	M–3



1 E1 SITE ELECTRIC PLAN
SCALE 1/8"=1'-0"



5 E1 BURIED UG ELECTRIC
SCALE NONE



6 E1 SIDE ELEVATION
SCALE 3/4"=1'-0"

TAG	EQUIPMENT DESCRIPTION	VOLTS	PHASE	KW	AMPS	BRK	HP	PANEL	CIR
CP	PUMP STN CONTROL PANEL	208V	3 Ø	—	—	100A	—	TRANSFER SWITCH	
P-1	PUMP NO. 1	208V	3 Ø	8.51	25.3	50A	7.5	CP	1
P-2	PUMP NO. 2	208V	3 Ø	8.51	25.3	50A	7.5	CP	2
	CONTROLS	120V	1 Ø	0.2	1.7	15A	—	CP	A
	PUMP STATION BLOWER	120V	1 Ø	0.1	0.7	15A	1/25	CP	B
	PUMP STATION HEATER	120V	1 Ø	1.5	12.5	15A	—	CP	C
	PUMP STATION REC	120V	1 Ø	—	—	20A	—	CP	D
P	AUX LOAD PANEL								
—	SITE LIGHT	120V	1 Ø	0.05	0.4	15A	—	P	01
—	SURGE PROTECTIVE DEVICE	208V	3 Ø	—	—	30A	—	P	02,04,06
—	RADIO TELEMETRY	120V	1 Ø	0.2	1.7	15A	—	P	03
—	GENERATOR BLOCK HEATER	120V	1 Ø	1.5	12.5	20A	—	P	08
—	GENERATOR BATTERY CHARGER	120V	1 Ø	0.1	0.8	15A	—	P	10
—	RECEPTACLE	120V	1 Ø	—	—	20A	—	P	12

8 E1 MECHANICAL EQUIPMENT ELECTRIC SCHEDULE
SCALE: NONE

GENERAL NOTES, SITE POWER

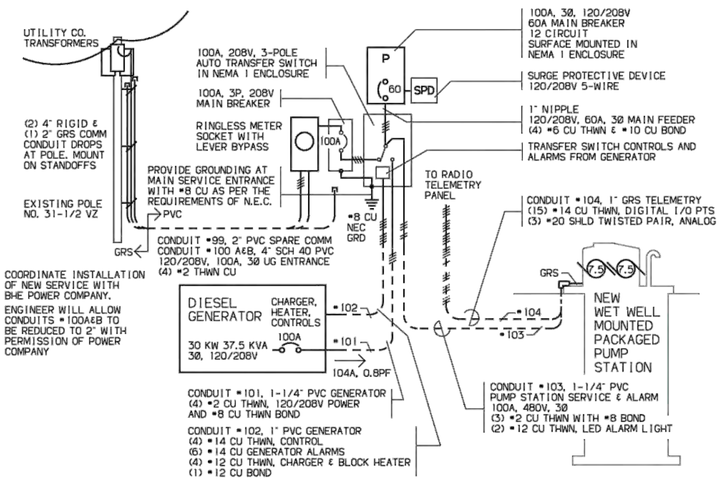
1. COORDINATE ELECTRICAL ENTRANCE REQUIREMENTS WITH LOCAL UTILITY REQUIREMENTS AT BEGINNING OF PROJECT.
2. COORDINATE INSTALLATION OF UNDERGROUND AND UNDER SLAB CONDUIT RUNS AT BEGINNING OF PROJECT.
3. CALL DIGSAFE (888) 344-7233 TO DETERMINE LOCATION OF UTILITY CABLES BEFORE EXCAVATION.
4. COORDINATE EXACT LOCATION OF EQUIPMENT AND CONDUIT RUNS WITH MECHANICAL AND CIVIL TRADES. ROUTING OF CONDUITS IS SCHEMATIC. COORDINATE FOR BEST ROUTING.
5. BURY MAIN SERVICE CONDUITS MIN 4'-0" BELOW GRADE TO MINIMIZE MOVEMENT BY FROST.
6. ALL SCREWS, FASTENERS & OTHER HARDWARE TO BE STAINLESS.
7. ALIGN DEVICES ON VERTICAL & HORIZONTAL CENTERS WHERE PRACTICAL.

SITE POWER SYMBOL LEGEND

- UNDERGROUND CABLE
- 3 CONDUCTORS & GROUND
- EXISTING EQUIPMENT
- ELECTRIC POLE
- UTILITY CO. METER
- POWER PANEL
- LED AREA LIGHT — LIGHTING FIXTURE NO. SEE SPECIFICATIONS
- RED LED ALARM LIGHT SUPPLIED WITH PUMP STATION

POWER RISER SYMBOL LEGEND

- P — LIGHTING/AUX POWER PANEL
- GENERATOR AUTOMATIC TRANSFER SWITCH
- CIRCUIT BREAKER
- MOTOR LOAD AS LISTED



2 E1 PUMP STATION POWER RISER
SCALE NONE

120/208V, 3Ø, 100A, 60A MAIN BREAKER, SURFACE MOUNT, NEMA 1 ENCLOSURE, 10,000 AIC

60A MAIN BREAKER					
NO	AMP	DESCRIPTION	NO	AMP	DESCRIPTION
01	15	SITE LIGHTING	02	30	SURGE
03	15	RADIO TELEMETRY	04	30	PROTECTIVE
05	15	SPARE	06	30	DEVICE
07	20	SPARE	08	15	GENERATOR CHARGER
09		BLANK	10	20	GENERATOR BLOCK HEATER
11		BLANK	12	20	RECEPTACLE AT RIGHT

3 E1 AUX LOAD PANEL PANEL P
SCALE: FULL — IN SERVICE CABINET

PLASTIC LAMINATE PLAQUE, MINIMUM 1-1/4" x 4", 3/32" BLACK ENGRAVED LETTERING ON A WHITE BACKGROUND & SECURED WITH MECHANICAL SCREW FASTENERS. EXCLUSIVE USE OF ADHESIVE MOUNTING IS NOT ACCEPTABLE.

PANEL P
60A 3Ø 120/208V

4 E1 NEW PANEL P TAG
SCALE: FULL — IN SERVICE CABINET

7 E1 SERVICE CABINET FRONT ELEVATION
SCALE 3/4"=1'-0"

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STATE OF MAINE — DWIGHT MARTIN LANPHER 5387 — LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET • WINTERPORT, MAINE

OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

DES.BY: DML	DR.BY: DML	CK.BY: RJR/MHO

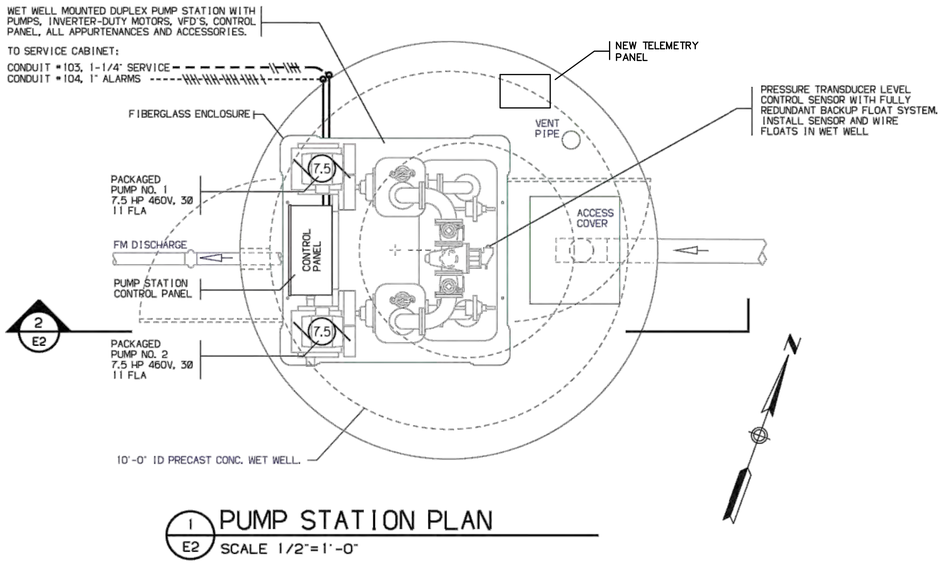
TOWN OF MACHIAS

EAST SIDE SEWER EXTENSION-PHASE 1

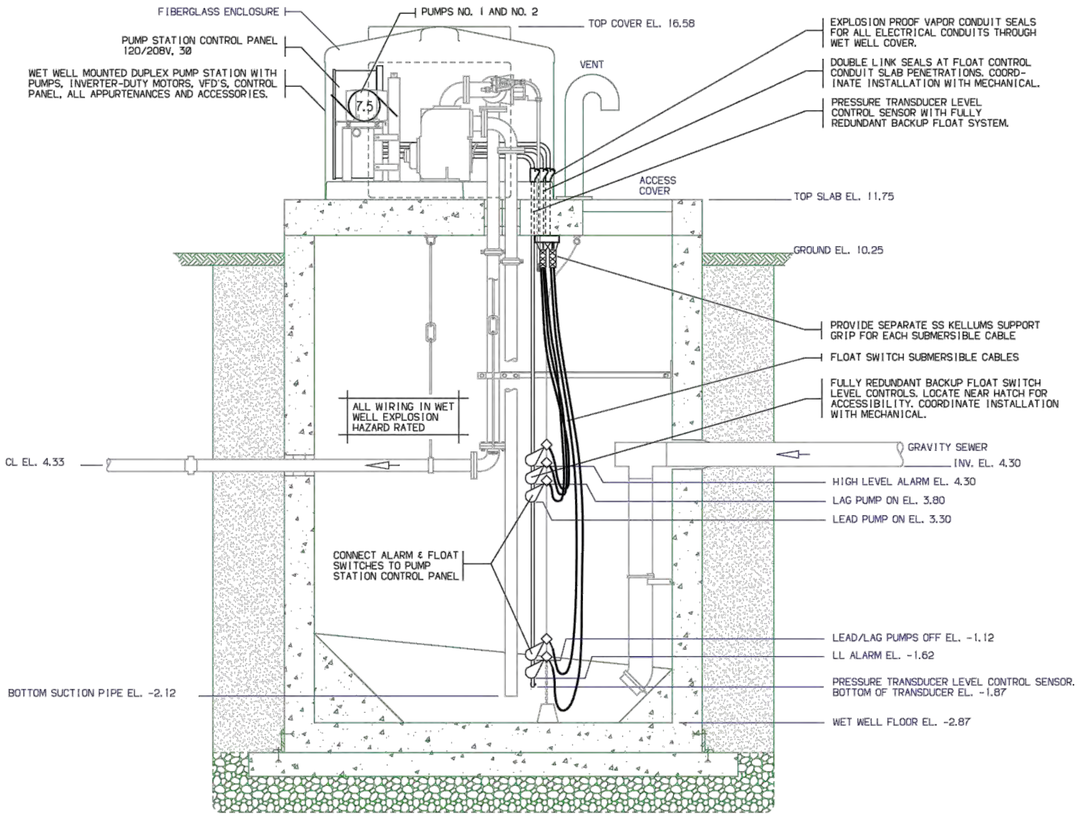
PUMP STATION SITE ELECTRIC PLAN RISER DIAGRAM & DETAILS

SCALE:	AS NOTED	JOB NO.: 1300	LA 2012-018
DATE:	JULY 2012	SHEET:	E-1

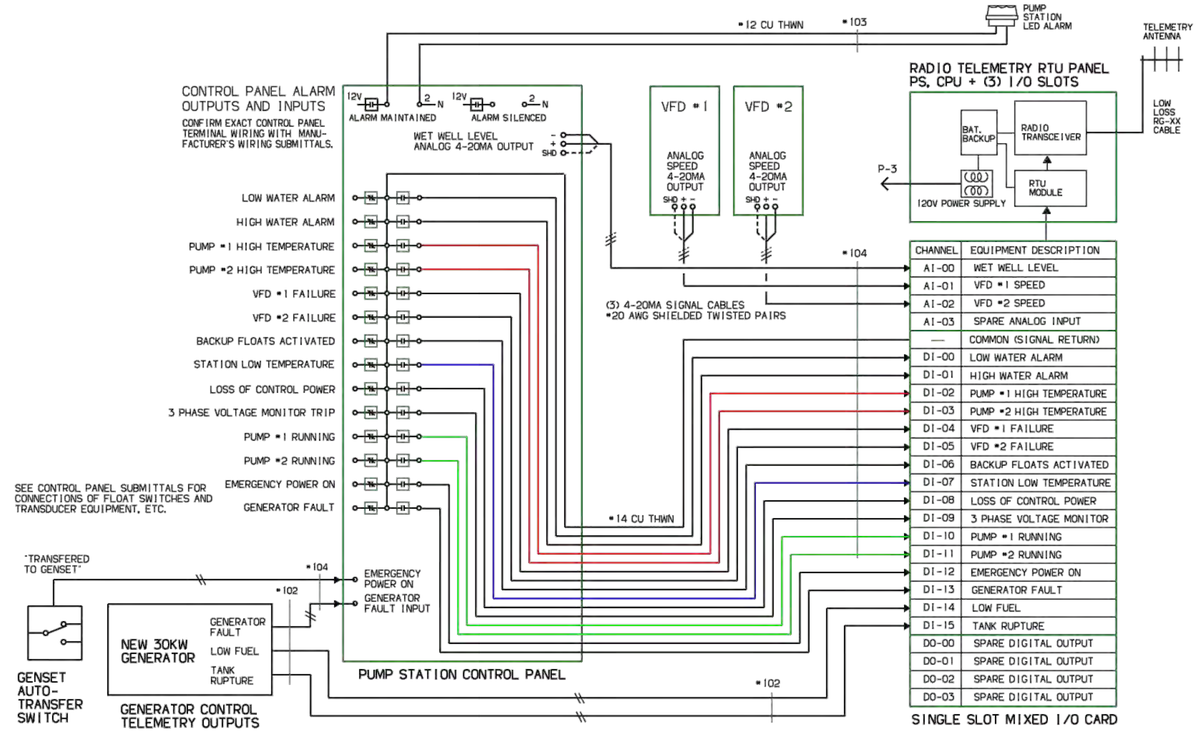
July 16, 2012



1 / E2 PUMP STATION PLAN
SCALE 1/2"=1'-0"



2 / E2 PUMP STATION SECTION
SCALE 1/2"=1'-0"



CHANNEL	EQUIPMENT DESCRIPTION
AI-00	WET WELL LEVEL
AI-01	VFD #1 SPEED
AI-02	VFD #2 SPEED
AI-03	SPARE ANALOG INPUT
—	COMMON (SIGNAL RETURN)
DI-00	LOW WATER ALARM
DI-01	HIGH WATER ALARM
DI-02	PUMP #1 HIGH TEMPERATURE
DI-03	PUMP #2 HIGH TEMPERATURE
DI-04	VFD #1 FAILURE
DI-05	VFD #2 FAILURE
DI-06	BACKUP FLOATS ACTIVATED
DI-07	STATION LOW TEMPERATURE
DI-08	LOSS OF CONTROL POWER
DI-09	3 PHASE VOLTAGE MONITOR
DI-10	PUMP #1 RUNNING
DI-11	PUMP #2 RUNNING
DI-12	EMERGENCY POWER ON
DI-13	GENERATOR FAULT
DI-14	LOW FUEL
DI-15	TANK RUPTURE
DO-00	SPARE DIGITAL OUTPUT
DO-01	SPARE DIGITAL OUTPUT
DO-02	SPARE DIGITAL OUTPUT
DO-03	SPARE DIGITAL OUTPUT

SINGLE SLOT MIXED I/O CARD

3 / E2 ALARM RISER DIAGRAM
SCALE: NONE — EAST SIDE EXTENSION PUMP STATION

TELEMETRY SYMBOL LEGEND

- DEVICE BLOCK
- CONNECTION
- NO CONNECTION
- 2 CONDUCTORS & GROUND
- SHIELDED TWISTED PAIR
- SHIELDED TWISTED PAIR INDIVIDUAL CONDUCTORS
- PANEL AS NOTED
- CONTROL RELAY, N. O. CONTACTS
- CONTROL RELAY, N. C. CONTACTS
- RED LED ALARM LIGHT
- NON-MERCURY FLOAT SWITCH
- POWER SUPPLY MODULE
- DIRECTIONAL YAGI ANTENNA

GENERAL NOTES, TELEMETRY

1. LAY OUT NEW EQUIPMENT LOCATIONS IN FIELD WITH ENGINEER.
2. OTHER DEVICES SHOWN FOR COORDINATION PURPOSES ONLY.
3. ALIGN DEVICES ON VERTICAL & HORIZONTAL CENTERS WHERE PRACTICAL.
4. ALL SCREWS, FASTENERS & OTHER HARDWARE TO BE SS.
5. ROUTE INPUT AND OUTPUT LOW LEVEL SIGNALS IN SEPARATE CONDUITS AS SHOWN. DO NOT COMBINE WITHOUT PRIOR AUTHORIZATION OF ENGINEERS.
6. ALL CONTROLS SHALL BE WIRED WITH CLASS 1 WIRING METHODS REGARDLESS OF VOLTAGE FOR SECURE AND PROTECTED CONNECTIONS.
7. TEST ALL CONTROL CIRCUITS FOR SHORTS BEFORE CONNECTING TO DEVICES.
8. FIELD LOCATE BACK-UP FLOAT SYSTEM NEAR ACCESS HATCH FOR EASE OF RETRIEVAL.
9. SOME ELEMENTS IN SECTION SHOWN ROTATED OUT OF PHASE FOR CLARITY.

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OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION
DES.BY: DML	DR.BY: DML / CK.BY: RJR/MHO

TOWN OF MACHIAS

EAST SIDE SEWER EXTENSION-PHASE 1

PUMP STATION ELECTRICAL PLAN, SECTION & TELEMETRY DETAILS

SCALE: AS NOTED	JOB NO.: 1300 LA 2012-018
DATE: JULY 2012	SHEET: E-2

4 NEW ALARM CHANNELS & 3 NEW ANALOG CHANNELS WIRED DIRECTLY FROM NEW RADIO TELEMETRY PANEL

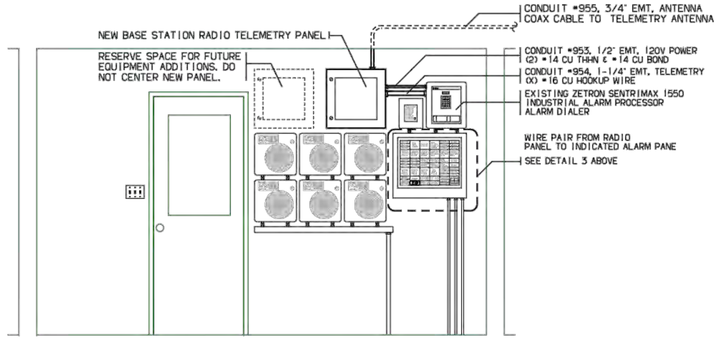
INPUTS ARE RECEIVED OVER MODBUS CONNECTION FROM PLC-2 FOR DISPLAY ON THIS PANEL. (1) NEW ALARM WIRED DIRECTLY FROM NEW RADIO TELEMETRY PANEL

CSO STATION PANEL ALARM	CSO GATE ALARM	GRINDER FAILURE	GRIT CHAMBER BLOWER 4 FAILURE	INFLUENT PANEL ALARM	(SPARE)
CSO HIGH LEVEL				INFLUENT HIGH LEVEL	(SPARE)
CSO LOW LEVEL				INFLUENT LOW LEVEL	(SPARE)
AERATION BLOWER 1 FAILURE	AERATION BLOWER 2 FAILURE	AERATION BLOWER 3 FAILURE	CLARIFIER 1 HIGH TORQUE ALARM	CLARIFIER 2 HIGH TORQUE ALARM	CLARIFIER 3 HIGH TORQUE ALARM
BLOWER 5 FAILURE	SCUM TANK CONTROLS ALARM	AERATED SLUDGE STORAGE HIGH LEVEL	SLUDGE THICKENER HIGH LEVEL	LIME MIXER HIGH LEVEL	(SPARE)
BLOWER 6 FAILURE	SCUM TANK HIGH LEVEL	AERATED SLUDGE STORAGE LOW LEVEL	SLUDGE THICKENER LOW LEVEL	LIME MIXER LOW LEVEL	(SPARE)
BLOWER 7 FAILURE	SCUM TANK LOW LEVEL			OUTFALL TANK TRANSDUCER HIGH LEVEL	EFFLUENT PANEL ALARM
RAS/WAS PUMP 1 FAILURE	RAS/WAS PUMP 2 FAILURE	RAS/WAS PUMP 3 FAILURE	TAS PUMP FAILURE	OUTFALL TANK FLOAT HIGH LEVEL	EFFLUENT HIGH LEVEL
				OUTFALL TANK GATE ALARM	EFFLUENT LOW LEVEL
HEADWORKS FLOODED	(SPARE)	BOILER LOW ANTIFREEZE	CHLOR RM LOW TEMP	GENERATOR GENERAL ALARM	AMETEK: SIL, ACK
INFLUENT PUMP ROOM FLOODED	EAST SIDE EXT. PUMP STATION	BUILDING LOW TEMPERATURE	DECHLOR RM LOW TEMP	LOW FUEL	AMETEK: TEST, RESET
RAS/WAS PUMP ROOM FLOODED				TANK RUPTURE	

CONNECT SINGLE NEW ALARM FROM RADIO TELEMETRY SYSTEM TO EXISTING PANALARM ANNUNCIATOR PANEL. PROVIDE NEW ENGRAVING FOR EXISTING BLANK PANE.

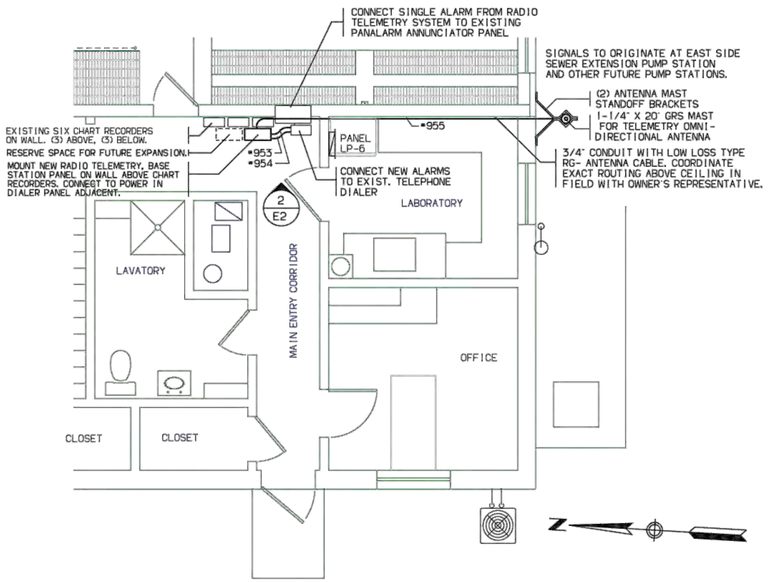
3 / E3 ANNUNCIATOR PANEL DETAIL

SCALE 1/2"=1'-0" — ON INSTRUMENT WALL



2 / E3 INSTRUMENT CORRIDOR EAST ELEVATION

SCALE 1/2"=1'-0" — WW TREATMENT PLANT ENTRY AREA



1 / E3 1ST FLOOR PART PLAN (SOUTHWEST CORNER)

SCALE 1/4"=1'-0" — WW TREATMENT PLANT ENTRY AREA

OMNI-DIRECTIONAL ANTENNA ~25' HEIGHT ABOVE GRADE

WALL (OR ROOF) MOUNTED, TELEMETRY RECEIVING ANTENNA AT TREATMENT PLANT. COORDINATE WITH OWNER'S REPRESENTATIVE TO OPTIMIZE EXACT MOUNTING LOCATION.

*955

LOW LOSS RG-XX RF CABLE

NEW RADIO TELEMETRY PANEL IN NEMA 1 ENCLOSURE IN WW PLANT INSTRUMENT CORRIDOR

*953

EXIST. LP5-16

TAKE POWER FROM EXIST. CIRCUIT AT EXIST. ZETRON SENTRIMAX PANEL ADJACENT

TRANSCEIVER

BATTERY

ACE 3600 POWER SUPPLY MODULE	ACE 3610/3640 CPU MODULE	1 8 CHANNEL ANALOG 4-20MA OUTPUT MODULE 1	2 (SPACE)	3 16 RELAY DIGITAL OUTPUT MODULE 3	4 16 RELAY DIGITAL OUTPUT MODULE 4	5 (SPACE)	6 (SPACE)	7 (SPACE)

PROVIDE RADIO TRANSCEIVER, 120V POWER SUPPLY WITH BATTERY BACKUP, TELEMETRY CPU MODULE AND 7 SLOT RACK FOR I/O CARDS.

*954

EXISTING ANNUNCIATOR PANEL

POINT	PLANT ALARM DESCRIPTION
1	CSO STATION PANEL ALARM
2	CSO HIGH LEVEL
3	CSO LOW LEVEL
4	CSO GATE ALARM
5	GRINDER FAILURE
6	GRIT CHAMBER BLOWER 4 FAILURE
7	INFLUENT PANEL ALARM
8	INFLUENT HIGH LEVEL ALARM
9	INFLUENT LOW LEVEL ALARM
10	(SPARE)
11	(SPARE)
12	(SPARE)
13	AERATION BLOWER 1 FAILURE
14	AERATION BLOWER 2 FAILURE
15	AERATION BLOWER 3 FAILURE
16	CLARIFIER 1 HIGH TORQUE ALARM
17	CLARIFIER 2 HIGH TORQUE ALARM
18	CLARIFIER 3 HIGH TORQUE ALARM
19	BLOWER 5 FAILURE
20	BLOWER 6 FAILURE
21	BLOWER 7 FAILURE
22	SCUM TANK CONTROLS ALARM
23	SCUM TANK HIGH LEVEL ALARM
24	SCUM TANK LOW LEVEL ALARM
25	AERATED SLUDGE STORAGE HIGH LEVEL
26	AERATED SLUDGE STORAGE LOW LEVEL
27	SLUDGE THICKENER HIGH LEVEL
28	SLUDGE THICKENER LOW LEVEL
29	LIME MIXER HIGH LEVEL
30	LIME MIXER LOW LEVEL
31	(SPARE)
32	(SPARE)
33	RAS/WAS PUMP 1 FAILURE
34	RAS/WAS PUMP 2 FAILURE
35	RAS/WAS PUMP 3 FAILURE
36	TAS PUMP FAILURE
37	OUTFALL TANK TRANSDUCER HIGH LEVEL
38	OUTFALL TANK TRANSDUCER FLOAT LEVEL
39	OUTFALL TANK GATE ALARM
40	EFFLUENT PANEL ALARM
41	EFFLUENT HIGH LEVEL ALARM
42	EFFLUENT LOW LEVEL ALARM
43	HEADWORKS FLOODED
44	INFLUENT PUMP ROOM FLOODED
45	RAS/WAS PUMP ROOM FLOODED
46	(SPARE)
47	**EAST SIDE EXT. PUMP STATION ALARM**
48	BOILER LOW ANTI-FREEZE
49	BUILDING LOW TEMPERATURE
50	CHLORINE ROOM LOW TEMPERATURE
51	DECHLOR ROOM LOW TEMPERATURE
52	GENERATOR GENERAL ALARM
53	GENERATOR LOW FUEL ALARM
54	GENERATOR TANK RUPTURE ALARM

EXISTING INPUTS FROM PLANT ALARMS

CONNECT SINGLE ALARM FROM RADIO TELEMETRY SYSTEM TO EXIST. PANALARM ANNUNCIATOR PANEL

EXIST. ZETRON SENTRIMAX MODEL 1550

EXIST. TO TELEPHONE NETWORK

*900

LP5-16

DOMESTIC PS BOARD — 120VAC INPUT

MAIN BOARD

J1-PHONE RJ11C: NC, NC, RING, TIP, NC, NC — TO PHONE

ADD TAPI CHIP SET TO DIALER FOR NUMERICALLY CODED PAGE ALERTS. PROGRAM ALARM PROCESSOR TO OUTPUT SEQUENTIAL (1 THRU 64) CHANNEL CODES FOR EACH CURRENT AND FUTURE ALARM POINT.

EXISTING 0-5VDC /4-20MA INPUTS

CONNECT NEW ANALOG SIGNAL INPUTS

DIGITAL I/O BOARD — DIGITAL I/O BOARD — DIGITAL I/O BOARD — DIGITAL I/O BOARD

CH 61 — CH 62 — CH 63 — CH 64

WIRE NEW PUMP STATION ALARMS FROM LAST INPUTS BACK (64, 63, 62, 61) TO MINIMIZE LAYOUT CONFUSION WITH EXISTING ALARM POINTS.

4 / E3 ALARM CIRCUIT SCHEMATIC & SCHEDULE

SCALE: NONE — AT WW TREATMENT PLANT

NEW RADIO TELEMETRY OUTPUTS AT WW PLANT

CH	EQUIPMENT DESCRIPTION	
A00	WET WELL LEVEL	
A01	VFD #1 SPEED	
A02	VFD #2 SPEED	
A03	SPARE ANALOG OUTPUT	N.C.
A04	SPARE ANALOG OUTPUT	N.C.
A05	SPARE ANALOG OUTPUT	N.C.
A06	SPARE ANALOG OUTPUT	N.C.
A07	SPARE ANALOG OUTPUT	N.C.
D00	LOW WATER ALARM	
D01	HIGH WATER ALARM	
D02	PUMP #1 HIGH TEMPERATURE	
D03	PUMP #2 HIGH TEMPERATURE	
D04	VFD #1 FAILURE	
D05	VFD #2 FAILURE	
D06	BACKUP FLOATS ACTIVATED	
D07	STATION LOW TEMPERATURE	
D08	LOSS OF CONTROL POWER	
D09	3 PHASE VOLTAGE MONITOR	
D10	PUMP #1 RUNNING	N.C.
D011	PUMP #2 RUNNING	N.C.
D012	EMERGENCY POWER ON	N.C.
D013	GENERATOR FAULT	
D014	LOW FUEL	
D015	TANK RUPTURE	

ZETRON SENTRIMAX INDUSTRIAL ALARM PROCESSOR

ANALOG INPUT	0-5VDC/4-20MA	
CH 1	WET WELL LEVEL	ANALOG SIGNALS TO BE ACCESSED ON LCD PANEL.
CH 2	VFD #1 SPEED	
CH 3	VFD #2 SPEED	
DIGITAL INPUT		
CH 61	STATION WET WELL LEVEL ALARM	
CH 62	STATION PUMP FAILURE	
CH 63	STATION LOW TEMPERATURE ALARM	
CH 64	STATION ELECTRICAL/GENERATOR ALARM	

ALL SIGNALS TRANSMITTED TO WW PLANT FOR SEGREGATION AT FUTURE SCADA TERMINAL DISPLAY. FOR THIS PROJECT, PARALLEL OUTPUT CHANNELS, AS INDICATED, FOR COMMON ALARM POINT.

5 / E3 SIGNAL REDUCTION TO DIALER

SCALE 1/4"=1'-0" — AT WW TREATMENT PLANT

CH	ANALOG EQUIPMENT DESCRIPTION
01	STATION WET WELL LEVEL
02	STATION VFD #1 SPEED
03	STATION VFD #2 SPEED
04	SPARE

NEW ANALOG INPUTS WIRED DIRECTLY TO DIALER

CH	DIGITAL EQUIPMENT DESCRIPTION
CH 61	STATION WET WELL LEVEL ALARM
CH 62	STATION PUMP FAILURE
CH 63	STATION LOW TEMPERATURE ALARM
CH 64	STATION ELECTRICAL/GENERATOR ALARM

NEW DIGITAL INPUTS WIRED DIRECTLY TO DIALER

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OCT, 2013	RECORD DRAWING
DATE	ADDITION OR REVISION

DES.BY: CML	DR.BY: CML	CK.BY: RJR/MHO

TOWN OF MACHIAS

EAST SIDE SEWER EXTENSION-PHASE 1

MACHIAS WW TREATMENT PLANT NEW TELEMETRY PLANS & DETAILS

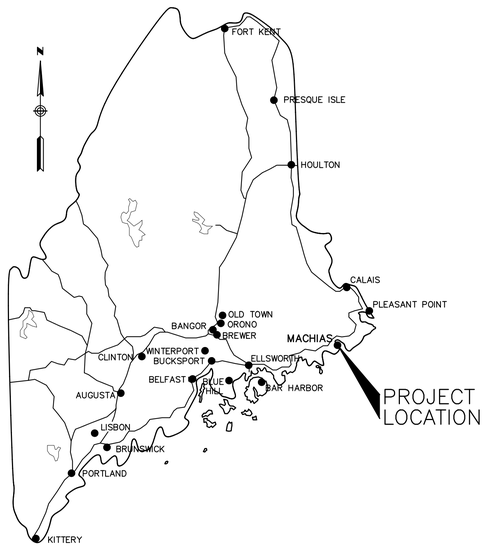
SCALE: AS NOTED	JOB NO.: 1300	LA 2012-018
DATE: JULY 2012	SHEET: E-3	

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

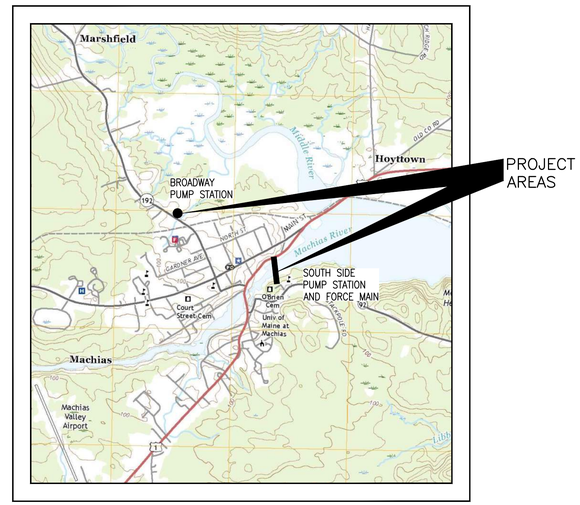
PROJECT NO. 2260
CWSRF NO. C230093-08

OCTOBER, 2022



LOCATION MAP

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER
12-7-22



AREA MAP

OLVER ASSOCIATES INC.

ENVIRONMENTAL ENGINEERS

290 MAIN STREET WINTERPORT, MAINE

GENERAL NOTES

1. UTILITY AND EQUIPMENT LOCATIONS AS SHOWN ARE APPROXIMATE BASED ON AVAILABLE INFORMATION AT TIME OF SURVEY. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD LOCATION AND CONFIRMATION OF ALL EXISTING UTILITIES INCLUDING SEWER, DRAINAGE, WATER, ELECTRICAL, TELEPHONE, AND CABLE PIPES AND CONDUITS. IT IS POSSIBLE THAT OTHER ACTIVE AND INACTIVE UTILITIES MAY EXIST IN THE PROJECT AREA. CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION.

2. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE OWNER OF EACH UTILITY TO FIELD LOCATE AND TO MINIMIZE DISRUPTION. CONTINUOUS SEWER, WATER, AND DRAIN SERVICES MUST BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.

3. LOCATION OF WATER LINES ARE SHOWN IN APPROXIMATE LOCATIONS AS PROVIDED BY THE MACHIAS WATER COMPANY. ANY INDICATED WATER LINE DEPTH IS APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.

4. TEST PITS ARE REQUIRED IN ADVANCE AT ALL BURIED PIPING TIE–IN LOCATIONS TO VERIFY LOCATION AND ELEVATION.

5. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ANY UNDERGROUND PUBLIC OR PRIVATE ELECTRICAL AND TELEPHONE UTILITIES WITH DIG–SAFE OR OWNER PRIOR TO EXCAVATION.

6. BORING AND GEOTECHNICAL INFORMATION IS SHOWN FOR CONTRACTOR'S REFERENCE ONLY. ACTUAL SUBSURFACE CONDITIONS MAY VARY. GEOTECHNICAL REPORT FOR RIVER CROSSING AREA IS INCLUDED AS AN APPENDIX TO THE SPECIFICATIONS.

7. PROPERTY BOUNDARIES AND RIGHT–OF–WAY LIMITS SHOWN ON PLANS ARE APPROXIMATE BASED ON FIELD EVIDENCE OBSERVED AND AVAILABLE TAX MAPS AND ARE INCLUDED FOR REFERENCE ONLY. NO LEGAL REPRESENTATION IS INTENDED NOR WAS ANY FORMAL BOUNDARY SURVEY CONDUCTED.

8. CONTRACTOR SHALL PROPERLY PROTECT AND AVOID DISTURBING PROPERTY PINS AND MONUMENTS. IF DISTURBED, THE PROPERTY PIN OR MONUMENT SHALL BE RESET AT CONTRACTOR'S EXPENSE BY A REGISTERED LAND SURVEYOR APPROVED BY THE ENGINEER.

9. CONTRACTOR SHALL CONTACT OWNERS OF UTILITY POLES ADJACENT TO EXCAVATION AREAS TO ARRANGE POLE SUPPORT DURING EXCAVATION AS REQUIRED.

10. CONTRACTOR IS RESPONSIBLE FOR THE LAYOUT OF ALL PROPOSED WORK. ENGINEER WILL ASSIST ONLY IN PROVIDING REFERENCE POINTS AND ELEVATION DATA FOR INITIAL LAYOUT ONLY. CONTRACTOR SHALL MAINTAIN LAYOUT THROUGHOUT PROJECT.

11. CONTRACTOR SHALL EXERCISE APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN ACCORDANCE WITH ACCEPTED PRACTICE, APPLICABLE LAWS AND REGULATIONS, AND REQUIREMENTS OF THESE CONTRACT DOCUMENTS.

12. CONTRACTOR SHALL CONTROL DUST GENERATED DURING THE PROJECT TO A LEVEL SATISFACTORY TO THE OWNER AND ENGINEER.

13. CONTRACTOR SHALL REPAIR ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

14. LOAM AND SEED ALL DISTURBED LAWN AREAS WITH 4" LOAM, HYDROSEED, AND MULCH.

15. ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UNLESS OTHERWISE NOTED. COST OF RESTORATION IS INCIDENTAL TO CONTRACT OUTSIDE OF PAY LIMITS.

16. ALL NEW SEWERS AND WET WELL SHALL BE PROPERLY FLUSHED AND CLEANED BY CONTRACTOR AT COMPLETION OF PROJECT AND WHENEVER CONSTRUCTION DEBRIS ENTERS OPEN PIPE WORK AND/OR NEW WET WELL. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT CONSTRUCTION MATERIALS AND DEBRIS FROM ENTERING OPEN SEWER LINES AND PUMP STATION WET WELL AND SHALL BE RESPONSIBLE FOR THE COST OF ANY REPAIRS FROM DAMAGE THAT RESULTS FROM SUCH DEBRIS. LINES AND WET WELL SHALL BE FLUSHED WITH HIGH PRESSURE JETTING EQUIPMENT AND CLEANED WITH VACUUM TRUCK. GRAVITY FLUSHING IS NOT ACCEPTABLE.

17. MANHOLE RIM ELEVATIONS ARE PROVIDED ON PLAN SHEETS TO ESTABLISH GENERAL HEIGHT OF NEW STRUCTURES FOR BIDDING PURPOSES. EXACT FINAL RIM ELEVATIONS SHALL BE ESTABLISHED IN FIELD SUCH THAT TOP OF RIM IS 0.03' (3/8") BELOW FINAL PAVEMENT IN PAVED AREAS. ALL NEW MANHOLE RIMS IN PAVED AREAS SHALL BE SET TO FINAL GRADE AFTER APPLICATION OF BINDER PAVEMENT AND PRIOR TO PLACEMENT OF FINISH LAYER OF SURFACE PAVEMENT WHERE APPLICABLE. CONTRACTOR SHALL FIELD VERIFY FINAL ELEVATIONS WITH ENGINEER.

18. ALL DISTURBED ASBESTOS CEMENT (AC) PIPING SHALL BE REMOVED FROM TRENCH AND SEGREGATED FROM GENERAL CONSTRUCTION FILL. DISPOSAL OF ALL AC PIPING IS REGULATED UNDER THE MAINE DEP CHAPTER 401 RULES. DISPOSAL OF ALL OTHER MATERIAL SHALL COMPLY WITH DEP DISPOSAL REQUIREMENTS.

19. ALL TRENCH ROUTES IN EXISTING PAVED AREAS SHALL BE SAW CUT PRIOR TO DISTURBANCE OF PAVEMENT AND AGAIN BEFORE FINAL PAVING. PROVIDE GROUND OVERLAP JOINT FOR SMOOTH TRANSITION BETWEEN NEW AND EXISTING PAVED SURFACES.

20. RESET OR REPLACE ALL EXISTING SITE FEATURES AS SOON AS IS PRACTICAL.

21. CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY TO ENSURE THAT ALL WORK MEETS ALL OSHA AND OTHER APPLICABLE CODE, HEALTH, AND SAFETY REQUIREMENTS.

22. NO TREES OR LANDSCAPING ALONG PROJECT ROUTE SHALL BE TRIMMED OR REMOVED WITHOUT PRIOR PERMISSION OF ENGINEER.

23. ALL SEWER AND FORCE MAINS WITH LESS THAN FIVE FEET OF COVER SHALL BE INSULATED WITH TWO INCHES OF RIGID INSULATION AT FULL TRENCH WIDTH UNLESS FOUR INCHES IS NOTED ON PLANS. ALL PRESSURIZED FORCE MAINS REQUIRE CONCRETE THRUST BLOCKS AT ALL CHANGES IN DIRECTION.

24. ALL PIPE PENETRATIONS THROUGH CONCRETE SLABS AND WALLS SHALL BE CORED AND DOUBLE LINK SEALED. SINGLE LINK SEALS ARE ACCEPTABLE THROUGH WET WELL WALLS WHERE A DOUBLE LINK SEAL WILL NOT FIT.

25. COORDINATE ALL EARTHWORK BETWEEN CIVIL, MECHANICAL, AND ELECTRICAL SHEETS FOR YARD PIPING AND CONDUIT INSTALLATION. ALL ELECTRICAL WORK MAY NOT BE SHOWN ON CIVIL SHEETS.

26. CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED ITEMS ONLY AFTER CONSULTING WITH OWNER. OWNER RETAINS FIRST REFUSAL RIGHTS FOR ALL SALVAGED ITEMS. ITEMS NOT WANTED BY THE OWNER SHALL BE REMOVED FROM SITE BY THE CONTRACTOR AND PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LAWS.

27. EQUIPMENT LAYOUT SHOWN ON PLANS IS BASED ON SPECIFIED PRODUCTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED AFTER SUBMITTAL REVIEW OF ALL FINAL EQUIPMENT MODELS.

28. CONTRACTOR IS RESPONSIBLE FOR THE PAYMENT OF ALL TEMPORARY ELECTRICAL COSTS RELATED TO THE CONSTRUCTION OF THIS PROJECT SUCH AS TEMPORARY POLES, METERING, CONSTRUCTION EQUIPMENT POWER, AND NORMAL POWER CONSUMPTION. OWNER IS RESPONSIBLE FOR ANY SPECIAL FEES ASSESSED BY UTILITY COMPANY FOR PERMANENT, CAPITAL SERVICE UPGRADES.

29. ALL SURFACES TO BE PAINTED SHALL BE PREPARED AND PAINTED IN ACCORDANCE WITH SPECIFICATIONS AND PAINT MANUFACTURER'S REQUIREMENTS.

30. ALL WORK TO BE CONDUCTED WITHIN MDOT RIGHT–OF–WAY SHALL COMPLY WITH ALL CONDITIONS OF MDOT HIGHWAY OPENING PERMIT.

31. ALTERNATE BID NO. 1 IS THE REPLACEMENT OF VALVES AND PIPING IN THE BROADWAY PUMP STATION WET WELL AND PAINTING OF EXISTING PIPING, VALVES, AND SUPPORTS.

32. ALTERNATE BID NO. 2 IS THE REPLACEMENT OF LIGHTING AND VENTILATION IN EXISTING SIPHON INFLUENT CHAMBER.

33. ALTERNATE BID NO. 3 IS RECONSTRUCTION OF THE EXISTING DRIVEWAY AND ASSOCIATED GRADING AND PAVING OF EXPANDED AREAS AS SHOWN ON DRAWINGS.

34. DESIGN INTENT IS FOR EXISTING SIPHON STRUCTURE AND TRIPLE 6"ø HPDE SIPHON RIVER CROSSING TO REMAIN AS A BACK–UP SYSYEM AT COMPLETION AND ACTIVATION OF THE NEW PUMP STATION. CONTRACTOR SHALL FLUSH AND CLEAN EXISTING 6"ø HDPE RIVER CROSSING PIPES AND EXISTING SIPHON STRUCTURE AT COMPLETION OF PROJECT IN PREPARATION FOR USE AS A BACK–UP SYSTEM.

35. CONTRACTOR SHALL CONDUCT CONSTRUCTION ACTIVITIES WITH EXTREME CAUTION WITH RESPECT TO PROTECTING THE EXISTING SIPHON STRUCTURE AND SIPHON RIVER CROSSING PIPES FROM PLUGGING WITH ANY MATERIAL OR CONSTRUCTION DEBRIS. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADDITIONAL SCREENING IN THE SIPHON STRUCTURE DURING EXCAVATION AND INSTALLATION OF PROPOSED PIPING TO PROTECT EXISTING SIPHON STRUCTURE FROM TRENCHING ACTIVITIES. ANY TEMPORARY BY–PASS PUMPING SHALL BE DIVERTED TO AND THROUGH THE ADDITIONAL SCREENING MEASURES.

36. CONTRACTOR SHALL CONDUCT ALL WORK IN ACCORDANCE WITH NRPA PERMIT STANDARDS AND CONDITIONS INCLUDED IN APPENDIX B OF THE SPECIFICATIONS, INCLUDING, BUT NOT LIMITED TO:

- PROVIDE SPECIAL ATTENTION TO EROSION CONTROL FOR ALL WORK WITHIN 100 FEET OF RIVER.
- MULCH ALL DISTURBED SOIL WITHIN 7 DAYS OF DISTURBANCE AND PRIOR TO ANY STORM EVENT.
- WORK IN RIVER MUST OCCUR BETWEEN JULY 15 AND OCTOBER 1.
- THE TRENCH IN AND ADJACENT TO THE WETLAND MUST BE REFILLED WITH THE MATERIAL THAT WAS EXCAVATED. THE ORIGINAL GRADING AND ELEVATION OF THE WETLAND MUST BE RESTORED. RESIDUAL FILL MATERIAL MUST BE REMOVED FROM THE WORK AREA AND PROPERLY STABILIZED.
- ANY TRENCH EXCAVATION THAT OCCURS WITHIN THE RIVER MUST UTILIZE A DRY CROSSING METHOD SUCH AS DIVERTING WATER FLOW BY COFFER DAM AND PUMPING AROUND THE AREA OF EXCAVATION. THE TRENCH WIDTH MUST BE NO WIDER THAN NECESSARY TO INSTALL THE PIPE.
- WHEELED OR TRACKED EQUIPMENT MAY NOT OPERATE IN THE WATER. EQUIPMENT OPERATING ON THE SHORE MAY REACH INTO THE WATER WITH A BUCKET OR SIMILAR EXTENSION. EQUIPMENT MAY CROSS RIVER ON ROCK, GRAVEL OR LEDGE BOTTOM.
- ANY DEBRIS GENERATED DURING THE ACTIVITY MUST BE PREVENTED FROM WASHING DOWNSTREAM AND MUST BE REMOVED FROM RIVER.
- TEMPORARY ROADS CONSTRUCTED OF FILL ARE NOT ALLOWED IN THE RIVER EXCEPT THAT FILL MAY BE USED ON TOP OF MATS OR PLATFORMS FOR EQUIPMENT ACCESS.
- BLASTING IN INUNDATED AREAS IS PROHIBITED.

LEGEND*

- EXISTING SEWER MANHOLE
- EXISTING DRAIN MANHOLE
- PROPOSED SEWER/DRAIN MANHOLE
- EXISTING SEWER LINE
- EXISTING SEWER SERVICE
- PROPOSED SEWER LINE
- PROPOSED SEWER SERVICE
- EXISTING COMBINED SEWER
- EXISTING FORCE MAIN
- PROPOSED FORCE MAIN
- EXISTING WATER LINE
- EXISTING WATER SERVICE
- PROPOSED WATER LINE
- PROPOSED WATER SERVICE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN SERVICE
- EXISTING UNDERDRAIN
- PROPOSED UNDERDRAIN
- EXISTING CULVERT
- PROPOSED CULVERT
- EXISTING WATER WEDGE VALVE
- EXISTING WATER CURB STOP
- PROPOSED WATER WEDGE VALVE
- PROPOSED CURB STOP
- EXISTING HYDRANT
- PROPOSED HYDRANT
- PROPOSED WELL
- EXISTING CATCH BASINS
- PROPOSED CATCH BASIN
- CAPPED LINE
- AIR LINE
- VENT LINE
- GRADING CUT LINE
- GRADING FILL LINE
- GRADING MATCH LINE
- TELEPHONE MANHOLE/THERMOSTAT
- CABLE TV MANHOLE
- ELECTRICAL MANHOLE

- GAS LINE
- BURIED TELEPHONE CABLE
- BURIED TV CABLE
- BURIED ELECTRIC CABLE
- OVERHEAD ELECTRIC CABLE
- OVERHEAD TELEPHONE CABLE
- UTILITY POLE
- UTILITY POLE ANCHOR
- UTILITY PEDESTAL
- BURIED CABLE JUNCTION BOX
- TRANSFORMER ON CONC. PAD
- STREET LIGHT
- YARD LIGHT
- PEDESTRIAN SIGNAL LIGHT
- DECORATIVE STREET LIGHT
- TRAFFIC SIGNAL POLE
- RAILROAD CROSSING SIGN/SIGNAL
- SATELLITE DISH
- SIDEWALK RAMP
- RIP–RAP
- RUBBLE STONE WALL
- CONCRETE, BLOCK OR GRANITE WALL
- DITCH, SWALE, STREAM, RIVER
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- SOFTWOOD TREE
- HARDWOOD TREE
- TREE CLUSTER
- BUSH
- BRUSH LINE
- TREE LINE

- EXISTING CURB (TYPE)
- PROPOSED CURB
- SURVEY CONTROL POINT
- PROPERTY IRON PIN
- RIGHT–OF–WAY MONUMENT
- RIGHT–OF–WAY LINE
- LOT LINE
- EASEMENT
- MAILBOX
- PROPANE TANK
- EXISTING SIGNS
- PROPOSED SIGN
- EXISTING BOLLARD/POST
- PROPOSED BOLLARD
- FLAGPOLE
- FENCE
- GUARD RAIL
- HANDICAPPED SYMBOL
- LEDGE OUTCROP
- LEDGE ENCOUNTERED
- NO REFUSAL
- TEST PIT REQUIRED
- MONITORING WELL
- TEST WELL
- BORING, OR PROBE
- WETLANDS AREA
- SEPTIC TANK
- ACCESS HATCH

*THESE ARE GENERAL SYMBOLS. NOT ALL APPEAR ON THESE DRAWINGS.

ABBREVIATIONS *

AB	ANCHOR BOLTS
AC	ASBESTOS CEMENT
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX;±	APPROXIMATELY
AVG	AVERAGE
ARV	AIR RELIEF VALVE
BITUM	BITUMINOUS
BL;℄	BASELINE
BLDG	BUILDING
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
BV	BACK VENT
C	CHANNEL
℄	CENTERLINE
CB	CATCH BASIN
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CJ	CONTROL JOINT
CL	CLEARING LIMITS OR CENTERLINE
CLG	CEILING
CLR	CLEAR
CL_2	CHLORINATION
CMP	CENTRAL MAINE POWER
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CONC.	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CPE	CORRUGATED POLYETHYLENE PIPE
CS	CARBON STEEL/COMBINED SEWER
CTS	COPPER TUBE SIZE
CU	COPPER
CULV	CULVERT
D	DRAIN OR DIAMETER
DBC	DIRECT BURIAL CABLE
DEP	DEPT OF ENVIRONMENTAL PROTECTION
DI	DUCTILE IRON
DIA;ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSIONS
DIN	GERMAN INSTITUTE FOR STANDARDIZATION
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DN	DOWN
DR	DRIVEWAY
DRN	DRAIN
DW	DOMESTIC WATER OR DRIVEWAY
DWV	DRAIN, WASTE, AND VENT
E	MODULUS OF ELASTICITY OR ELECTRIC
EA	EACH
EB	EMERGENCY BYPASS
EE	EACH END
EF	EACH FACE
EHW	EXTREME HIGH WATER
EJ	EXPANSION JOINT
EL;ELEV	ELEVATION
ELEC COND	ELECTRICAL CONDUIT
ELW	EXTREME LOW WATER
EMEC	EASTERN MAINE ELECTRICAL CO–OP INC.
EMH	ELECTRIC MANHOLE
EMM	EMERA MAINE
EQUIP	EQUIPMENT
EST	ESTIMATED
EW	EACH WAY
EXIST, EX	EXISTING
EXP	EXPANSION/EXPLOSION PROOF
EXT	EXTERIOR
EXTEN	EXTENSION
Fb	BENDING STRESS
Fc	COMPRESSIVE STRESS
Ft	TENSILE STRESS
FC	FIRE CODE
FCO	FLOOR CLEANOUT
FCS	FLOW CONTROL STRUCTURE
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FF;FIN FLR	FINISH FLOOR
FIN	FINISHED
FIN GR	FINISH GRADE
FLG	FLANGED
FLR	FLOOR
FLR'G	FLOORING
FM	FORCE MAIN
FOS	FACE OF STUD
FPT	FAIRPOINT COMMUNICATION
FR	FIRE RESISTANT
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
G	GAS LINE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GDN	GARDEN
GHT	GARDEN HOSE THREAD
GL	GLASS LINED
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GROUND
GWB	GYPSUM WALLBOARD
H	HEIGHT
HB	HOSE BIBB
HC	HOSE CLEANOUT
HDW	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
H P	HIGH POINT
HP	HORSEPOWER
HPC	BEGIN HORIZONTAL CURVE
HPI	HORIZONTAL CURVE TANGENT INTERSECTION
HPT	END HORIZONTAL CURVE
HT	HEIGHT
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IJ	ISOLATION JOINT
IN	INCHES
INF	INFLUENT
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
I\O	INPUT/OUTPUT
IP	IRON PIPE
JS	JANITOR SINK
JB	JUNCTION BOX
KD	KILN DRIED
LAT	LATERAL
LAV	LAVATORY
LE	LEVEL ELEMENT
LF	LINEAR FEET
LG	LONG OR LARGE
L	LEFT OR LENGTH
LKR	LOOKERS
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
LP	LOW POINT OR LIQUID PROPANE
LR	LONG RADIUS
LT	LEFT
MANUF	MANUFACTURER
MAT'L	MATERIAL
MB	MACHINE BOLTS
MAX	MAXIMUM
MC	MOISTURE CONTENT
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFG	MANUFACTURER
MH	MANHOLE
MHW	MEAN HIGH WATER
MIL	1/1000 INCH
MIN	MINIMUM
MJ	MECHANICAL JOINT
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MLW	MEAN LOW WATER
MM	MILLIMETER
MO	MASONRY OPENING
MON	MONUMENT
MPS	MAINE PUBLIC SERVICE
MRL	MEAN RIVER LEVEL
MS	MOISTURE SENSOR
MSL	MEAN SEA LEVEL
MTL	METAL
MW	MONITORING WELL
N/F	NOW/FORMERLY
NO	NUMBER
NMFS	NATIONAL MARINE FISHERIES SERVICE
NPS	NATIONAL PARK SERVICE
NPT	NATIONAL PIPE THREAD
NR	NO REFUSAL
NRPA	NATURAL RESOURCES PROTECTION ACT
NS	NEAR SIDE
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OPER	OPERATOR
OR	ORANGEBURG PIPE
PE	POLYETHYLENE OR PLAIN END
PEN	PENETRATION
PERF	PERFORATED
PEX	CROSS–LINKED POLYETHYLENE
PD	PURGE DIFFUSER
PI	PROPERTY IRON
PL	PLATE OR PROPERTY LINE
PLYWD	PLYWOOD
POLY	POLYETHYLENE PLASTIC
POTW	PUBLICLY OWNED TREATMENT WORKS
PROP	PROPOSED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
Q_{PK}	PEAK FLOW
R	RADIUS OR RIGHT
RAD	RADIUS
RAN	RANGE
RAS	RETURN ACTIVATED SLUDGE
RCEP	REINFORCED CONCRETE ELLIPTICAL PIPE
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCED OR REINFORCING BAR
RED	REDUCING
REF	REFRIGERATOR
REQ	REQUIRED
RESIL	RESILIENT
RET. WALL	RETAINING WALL
RGS	RIGID GALVANIZED STEEL
R.O.	ROUGH OPENING
RPM	REVOLUTIONS/MINUTE
RT	RIGHT
R/W	RIGHT OF WAY
S	SLOPE OR SEWER
SAN	SANITARY
SDR	STANDARD DIMENSION RATIOS
SCH	SCHEDULE
SCP	SURVEY CONTROL POINT
SCR	SCREENINGS
SECT	SECTION
SF	SQUARE FEET
SERV	SERVICE
SHT	SHEET
SHD	ROAD SHOULDER
SI	SPRAY IRRIGATION
SICPE	SMOOTH INTERIOR CORRUGATED POLYETHYLENE
SLG	SLUICE GATE
SPEC	SPECIAL
SPEC'S	SPECIFICATIONS
SP	SUMP PUMP
SQ	SQUARE
SR	SHORT RADIUS
SWR	SHOWER
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SUSP	SUSPENDED
SW	SIDEWALK OR SEAWATER
T	TELEPHONE OR THICKNESS
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
TBM	TEMPORARY BENCH MARK
TDH	TOTAL DYNAMIC HEAD
TEFC	FULLY ENCLOSED MOTOR
THR'HOLD	THRESHOLD
TOP	TOP OF PLATE
TR	TRUSS PIPE
TYP	TYPICAL
UG	UNDERGROUND
URN	URINAL
USDA	UNITED STATES DEPARTMENT OF AGRICULTURE
UST	UNDERGROUND STORAGE TANK
V	VENT
VAR	VARIES
VB	VAPOR BARRIER OR VACUUM BREAKER
VC	VITRIFIED CLAY
VER	VERIZON TELEPHONE
VERT.	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VPC	BEGIN VERTICAL CURVE
VPI	VERTICAL CURVE TANGENT INTERSECTION
VPT	END VERTICAL CURVE
VTR	VENT THROUGH ROOF
W	WATER OR WIDTH
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WC	WATER CLOSET
WCO	WALL CLEANOUT
WD	WOOD
WF	WIDE FLANGE
WH	WATER HEATER
WLD	WELDED
WR	WATER RESISTANT
WS	WATER SURFACE
W'STRIPPING	WEATHER STRIPPING
WW	WET WELL
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH

*THESE ARE GENERAL ABBREVIATIONS. NOT ALL APPEAR ON THESE DRAWINGS.

INDEX

STATE OF MAINE — ANNALEIS HAFFORD — No. 11562 — LICENSED PROFESSIONAL ENGINEER — 12-7-22

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY:	NWD	DR.BY:	NWD	CK.BY:	AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

GENERAL NOTES AND INDEX

SCALE:	NONE	PROJECT NO.:	2260
DATE:	OCTOBER, 2022	SHEET:	G–1

FUNCTIONAL DESCRIPTION OF INSTRUMENT IDENTIFICATION

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS	ANALOG	ALARM		
B	BURNER FLAME		USERS CHOICE	USERS CHOICE	USERS CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL OR DIGITAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAGING (DIMENSIONAL)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL OR LOAD		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY	MOTOR			MIDDLE OR INTERMEDIATE
N	USERS CHOICE		USERS CHOICE	USERS CHOICE	RUN
O	USERS CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY OR STATUS		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI-VARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY OR VACUUM			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	TORQUE			RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

THE FOLLOWING DESIGNATIONS ARE USED TO BETTER IDENTIFY AN INSTRUMENT FUNCTION

I/P	–	CURRENT TO PNEUMATIC CONVERTER
E/I	–	VOLTAGE TO CURRENT CONVERTER
Σ	–	ADD OR TOTALIZE
√	–	SQUARE ROOT
X	–	MULTIPLY
÷	–	DIVIDE
>	–	HIGH SELECT
MV	–	MEASURED VARIABLE
<	–	LOW SELECT
S.P.	–	SET POINT
⍁	–	INTEGRATE
f(x)	–	CHARACTERISTIC
P	–	PROPORTIONAL CONTROL MODE
D	–	DERIVATIVE
⨍	–	INTEGRAL CONTROL MODE
pH	–	HYDROGEN ION CONCENTRATION

NOTES:

1. PROPOSED EQUIPMENT, PIPING AND INSTRUMENTATION SHOWN BY SOLID OR EMBOLDENED DEPICTIONS. EXISTING SHOWN BY LIGHT OR DASHED DEPICTIONS.

2. INTERNAL CONTROL LOOPS, LOGIC, AND INSTRUMENTATION PROVIDED BY THE EQUIPMENT MANUFACTURER ARE DEPICTED IN THE MANUFACTURER'S EQUIPMENT SUBMITTALS AND ARE NOT REPRODUCED ON THESE PLANS IN THEIR ENTIRETY. THE CONTRACTOR SHALL REFER TO EQUIPMENT MANUFACTURER'S SUBMITTALS FOR EQUIPMENT WIRING INCLUDING ALL INTER-CONNECTIONS TO ANCILLARY EQUIPMENT.

3. ABBREVIATIONS AND SYMBOLS SHOWN ON THIS SHEET ARE GENERAL AND MAY NOT ALL BE INCLUDED IN THIS PROJECT.

TYPICAL SYMBOLS

- BAR SCREEN OR RACK
- STEP SCREEN
- GRINDER
- VORTEX DEGRITTER
- GRIT CLASSIFIER
- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- WELL PUMP
- METERING PUMP
- DIAPHRAGM OR PLUNGER PUMP
- PULSATION DAMPENER
- BLOWER
- AIR COMPRESSOR
- AIR COMPRESSOR W/TANK
- EXHAUST FAN
- STRAINER/FILTER
- POLYMER FEED SYSTEM (P)
- PRESSURE INDICATOR WITH DIAPHRAGM
- FLOW CALIBRATION STANDPIPE
- MOTOR (M)
- EXPANSION JOINT
- MAGNETIC FLOW METER (M)
- DOPPLER FLOW METER (M)
- TURBO FLOW METER (M)
- ULTRAVIOLET DISINFECTION
- HOPPER/BIN
- AUGER
- CONVEYOR
- SCREW PRESS
- BELT PRESS
- INSULATION WITH ELECTRIC HEAT TRACE
- INSULATION / PROCESS PIPE / ELECTRIC HEAT TRACE
- ELECTRIC INSTRUMENT LINE
- HYDRAULIC CONTROL LINE
- PNEUMATIC SIGNAL
- EXISTING PROCESS FLOW
- PROPOSED/MODIFIED PROCESS FLOW
- SOFTWARE OR DATA LINK

- SIGHT FLOW INDICATOR
- DOUBLE ACTING PNEUMATIC ACTUATOR
- STOP COCK
- BUTTERFLY VALVE
- GATE VALVE
- PLUG VALVE
- GLOBE VALVE
- PRESSURE OPERATING VALVE
- BALL VALVE
- PINCH VALVE
- SOLENOID VALVE (S)
- THREE WAY VALVE
- CHECK VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SAMPLING VALVE
- MOTORIZED VALVE
- POLYMER MIXING VALVE
- EDUCTOR
- SLIDE GATE
- SLUICE GATE
- SHEAR GATE
- MANUAL STOP GATE
- WEIR
- MOTORIZED WEIR
- TELESCOPING VALVE
- GAUGE
- QUICK DISCONNECT COUPLING
- PIPE CAP
- DOUBLE CONTAINED PIPING
- REDUCER
- LUBRICATOR (OILER)
- STRAINER
- AIR FILTER
- COMPRESSED AIR LINE PRESSURE (25)
- PIPE DIAMETER / FLUID CARRIED / PIPE MATERIAL (1/4"-FRP-SWW)
- AGITATOR (M)
- STATIC MIXER
- HOSE BIBB
- YARD HYDRANT
- AIR INTAKE FILTER/SILENCER
- SILENCER
- AIR FILTER/SILENCER DRAIN
- ROTOR
- MANHOLE
- FLUME
- PARABOLIC GRIT CHAMBER
- IMPACT SPRAY IRRIGATION SPRINKLER
- INTAKE SCREEN

TYPICAL PIPE, VALVES AND EQUIPMENT SYMBOLS

PIPE LINE DESIGNATION

AA – ATMOSPHERIC AIR
ACL – ALUMINUM CHLORIDE
AH – AMMONIUM HYDROXIDE
ALK – ALKALINITY
BIS– SODIUM BISULFITE
BKW – BACKWASH
BPS– BYPASS
CA – COMPRESSED AIR
CDS – CONDITIONED SLUDGE
CLS – CHLORINE SOLUTION
CSO – COMBINED SEWER OVERFLOW
CS – CONDITIONED SLUDGE
D – DECANT
DAF – FLOTATION THICKENER
DAS – DIGESTED ACTIVATED SLUDGE
DE – DEGRITTED EFFLUENT
DRN – DRAIN
DSL – DEWATERED SLUDGE (MECHANICAL)
EFF – EFFLUENT
EPS – EQUALIZED PRIMARY SLUDGE
F – FILTRATE
FC – FERRIC CHLORIDE
FW – FINISHED WATER
G – GRIT
GCO – GRIT CONVEYOR OVERFLOW
GTR – GRAVITY THICKENER RETURN
HCL – SODIUM HYPOCHLORITE
HDF – HYDRAULIC DRIVE FLUID
HSE – HYDRASIEVE EFFLUENT
IN – INFRANATANT
INF – INFLUENT
L – LIME
LSE – LAMELLA SETTLER EFFLUENT
LSS – LAMELLA SETTLER SLUDGE
MLSS – MIXED LIQUOR SUSPENDED SOLIDS
NRC – NUTRIENT RECYCLE
OFL – OVERFLOW
P – PHOSPHORIC ACID
PL – POLYMER
PMW – PAPER MILL WHITEWATER
PRI – PRIMARY EFFLUENT
PTW – POTABLE WATER
PW – PLANT WATER
RAS – RETURN ACTIVATED SLUDGE
RBC – RBC EFFLUENT
RPS – RAW PRIMARY SLUDGE
RW – RAW WATER
RWW – RAW WASTEWATER
SAM – SAMPLER LINE
SBE – SBR EFFLUENT
SBS – SBR SLUDGE
SCE – SECONDARY CLARIFIED EFFLUENT
SCM – SCUM
SCR – SCREENINGS
SE – SCREENED EFFLUENT
SEA – SEAWATER
SFA – SULFURIC ACID
SLD – SLUDGE
SLE – SECONDARY LAGOON EFFLUENT
SDH – SODIUM HYDROXIDE
SN – SUPERNATANT
SPT – SEPTAGE
SS – SCREENED SOLIDS
SW – SEAL WATER
TAS – THICKENED ACTIVATED SLUDGE
TPS – THICKENED PRIMARY SLUDGE
VA – VACUUM AIR
VTA – VENT TO ATMOSPHERE
WAS – WASTE ACTIVATED SLUDGE
WBS – WASTE BIOMASS SLUDGE

PIPE MATERIAL

ABS – ACRYLONITRILE BUTADIENE STYRENE
ACP – ASBESTOS CEMENT
CI – CAST IRON
CS – CARBON STEEL
Cu – COPPER
DI – DUCTILE IRON
FL – FLEX PIPE
FRP – FIBERGLASS REINFORCED PLASTIC
GCI – GLASS LINED CAST IRON
GDI – GLASS LINED DUCTILE IRON
GS – GALVANIZED STEEL
HDPE – HIGH DENSITY POLYETHYLENE
MPC – MANUFACTURER PROVIDED CONDUIT
OC – OPEN CHANNEL
PE – POLYETHYLENE
PP – POLYPROPYLENE
PVC – POLYVINYL CHLORIDE
PVDF – POLYVINYLIDENE FLUORIDE (KYNAR)
RC – REINFORCED CONCRETE
RGS – RIGID GALVANIZED STEEL
SS – STAINLESS STEEL
TEF – TEFLON

VALVE DESIGNATIONS

AOV – AIR OPERATED VALVE
ARV – AIR RELEASE VALVE
BF – BUTTERFLY VALVE
CK – CHECK VALVE
EJ – EXPANSION JOINT
EOV – ELECTRICALLY OPERATED VALVE
FCV – FLOW CONTROL VALVE
HCV – HAND CONTROL VALVE
HV – HAND VALVE
MOV – MOTOR OPERATED VALVE
PCV – PRESSURE CONTROL VALVE
PRV – PRESSURE RELIEF VALVE OR PRESSURE REGULATING VALVE
SG – SLIDE GATE VALVE
SLG – SLUICE GATE VALVE
SHR – SHEAR GATE VALVE
SP – SPECIAL FITTING
STP – MANUAL STOP GATE
TV – TELESCOPING VALVE
WG – WEIR GATE

EQUIPMENT DESIGNATION

B – BLOWER
C – CONVEYOR
E– GENERAL EQUIPMENT
EXP– EXPLOSION PROOF
M – MOTOR
MX – MIXER
P – PUMP
S – SUMP
SBM – SUBMERSIBLE
SWD – SIDE WALL DEPTH
T – TANK

CONDUIT DESIGNATIONS

E – ELECTRIC/INSTRUMENTATION
T – TELEPHONE

TYPICAL INSTRUMENT SYMBOLS

PI 500 – FUNCTIONAL IDENTIFICATION (SEE LEGEND TABLE) / LOOP IDENTIFICATION NUMBER

- PI 500 — FIELD MOUNTED
- PI 500 — AUXILIARY LOCATION
- PI 500 — FRONT PANEL MOUNTED
- PI 500 — REAR PANEL MOUNTED
- STATUS INDICATION
- HCV 101 — VALVE TAG

- COMPUTER CONTROL SYSTEM CONFIGURABLE FUNCTION (DISPLAYED IN CRT)
- COMPUTER CONTROL SYSTEM CONFIGURABLE FUNCTION (NOT DISPLAYED ON CRT)
- PROGRAMMABLE LOGIC CONTROLLER I/O
- 1 — UNIDENTIFIED INTERLOC LOGIC
- INCLUDED WITH PURCHASED EQUIPMENT OR EXISTING

HAND SWITCH POSITION SYMBOLS

(UNLABELLED SWITCHES ARE TO BE ON–OFF)

A – AUTOMATIC
C– CLOSE
H – HAND
J – JOG
L – LOCAL
M – MANUAL
O – OPEN OR OFF
R – REMOTE

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD	DR.BY: NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PIPING AND INSTRUMENTATION SYMBOLS

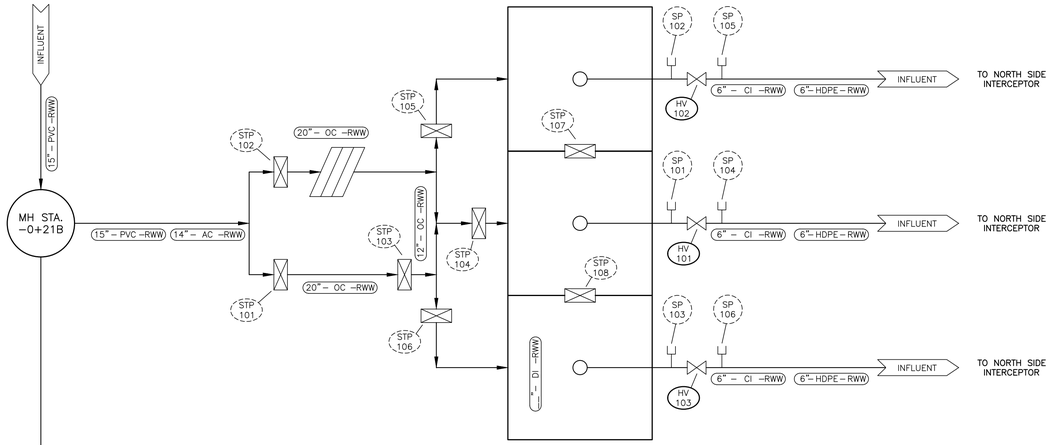
SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: G–2

X:\orsaes\Projects\MACHIAS\2260 South Side Pump Station\2260 G-02.dwg, 12/1/2022 2:24:35 PM, 1:1

EXISTING SIPHON HEADWORKS

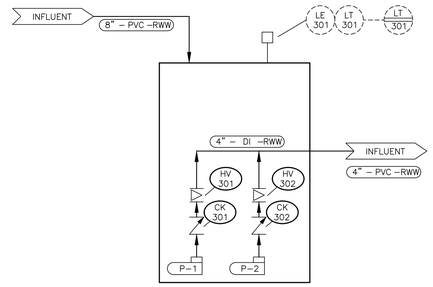
EXISTING BYPASS MANUAL SCREEN @ 1 1/2" O.C.

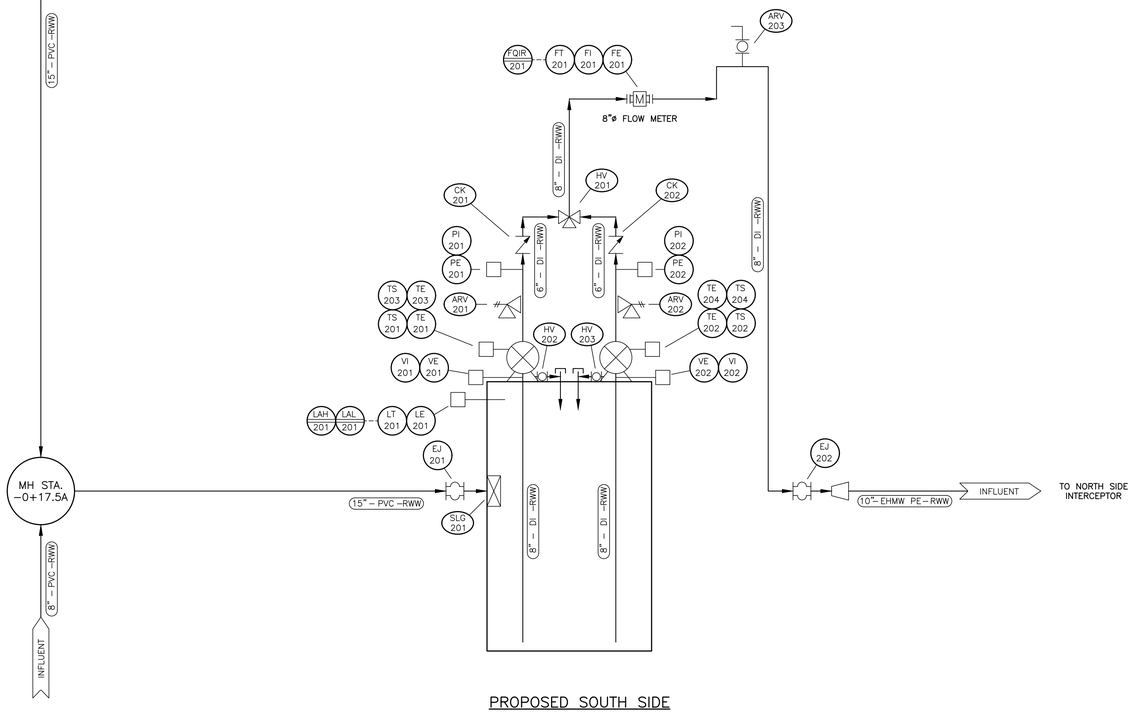
EXISTING INVERTED SIPHON INFLUENT CHAMBER (ALTERNATE BID NO. 2)



EXISTING BROADWAY PUMP STATION (ALTERNATE BID NO. 1)

EXISTING PUMPS AT 100 GPM @ 25' TDH/EACH
3 HP, 230 VAC, 1ø





PROPOSED SOUTH SIDE PUMP STATION

12'x12', 4,250 GALLONS
TWO PUMPS @ 600 TO 1,000 GPM @ 32' TO 53' TDH/EACH
30 HP, 460 VAC, 3ø, VFD'S

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TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PROCESS FLOW DIAGRAM

SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: G–3

REMOVE EXIST. PUMP STATION ELECTRICAL BACKBOARD, TELEMETRY EQUIPMENT, AND CONTROL CONDUITS. (COORDINATE WITH ELECTRICAL SHEETS.)

EXIST. SIPHON STRUCTURE (TO REMAIN)

EXIST. SAN. MH #S14, RIM EL. 25.41
E 8"ø LINED TR INV. IN EL. 15.69
W 14"ø LINED AC INV. IN EL. 15.19
N 14"ø AC INV. OUT EL. 15.09
(TO BE REPLACED)

REMOVE AND DISPOSE OF EXIST. STAGE.

REMOVE EXIST. SIPHON STRUCTURE ELECTRICAL EQUIPMENT, LIGHTING, AND EXHAUST FAN AND REPLACE WITH NEW. (SEE SHEET D-1.) (COORDINATE WITH ELECTRICAL AND HVAC SHEETS.) (ALTERNATE BID NO. 2)

REMOVE AND REPLACE EXIST. LINED 8"ø TR PIPE AS REQUIRED FOR NEW WORK. (SEE SHEET C-2.)

CONDUCT TEST PIT IN ADVANCE TO VERIFY LOCATION AND ELEVATION OF EXIST. 8"ø LINED TR SEWER MAIN AT PROPOSED MANHOLE LOCATION. (SEE NOTE NO. 2.)

REMOVE EXIST. 14"ø AC CULVERT AND REPLACE WITH NEW. (SEE SHEET C-3.)

CLEAR AND GRUB AREA AS REQUIRED TO CONDUCT NEW WORK. (TYP.)

CONDUCT TEST PIT IN ADVANCE TO VERIFY LOCATION AND ELEVATION OF EXIST. 8"ø LINED TR SEWER MAIN AT TIE IN LOCATION.

REMOVE AND RESET EXIST. FRAME AND COVER AS REQUIRED FOR NEW DRIVEWAY. (TYP. OF 3) (SEE DETAIL SHEET C-5.) (ALTERNATE BID NO. 3)

TBM: FLAGGED PK NAIL IN UP ELEV. 21.60

TBM: FLAGGED PK NAIL IN UP #10S ELEV. 65.16

TBM: FLAGGED PK NAIL IN UP #10 ELEV. 16.54

EXIST. SAN. MH RIM EL. 65.90± S 4"ø PVC INV. IN EL. 58.50 NE 8"ø PVC INV. OUT EL. 58.00 (TO REMAIN)

EXIST. CB, GRATE EL. 62.03 N 15"ø CMP INV. IN EL. 53.63 SW 15"ø CMP INV. OUT EL. 59.61

EXIST. SAN. MH RIM EL. 65.00± SW 8"ø PVC INV. IN EL. 57.59 NW 8"ø PVC INV. OUT EL. 57.49 (TO REMAIN)

EXIST. SAN. MH RIM EL. 55.50± E 6"ø PVC INV. IN EL. 48.08 SE 8"ø PVC INV. IN EL. 49.42 W 6"ø PVC INV. IN EL. 48.08 NW 8"ø PVC INV. OUT EL. 45.70 (TO BE MODIFIED) (ALTERNATE BID NO. 3)

EXIST. SAN. MH RIM EL. 32.19 SE 8"ø PVC INV. IN EL. 24.30 NW 8"ø PVC INV. OUT EL. 24.53 (TO BE MODIFIED) (ALTERNATE BID NO. 3)

EXIST. SAN. MH #S15 RIM EL. 26.31 S 8"ø PVC INV. IN EL. 19.25 E 8"ø LINED TR INV. IN EL. 16.07 W 8"ø LINED TR INV. OUT EL. 16.02 (TO BE MODIFIED) (ALTERNATE BID NO. 3)

EXIST. SAN. MH #S16 RIM EL. 26.59 E 8"ø LINED TR INV. IN EL. 16.83 W 8"ø LINED TR INV. OUT EL. 16.73 (TO REMAIN)

EXIST. CB GRATE EL. 14.40 NE 12"ø PVC INV. IN EL. 10.20 W 12"ø PVC INV. OUT EL. 10.20

EXIST. CB GRATE EL. 15.10 NW 4"ø PVC INV. IN EL. 11.19 SW 12"ø PVC INV. OUT EL. 10.65

EXIST. SAN. MH RIM EL. 15.93 W 18"ø AC INV. IN EL. 5.20 E 18"ø AC INV. OUT EL. 5.18

CONDUCT TEST PIT IN ADVANCE TO VERIFY LOCATION AND ELEVATION OF EXIST. 18"ø AC SEWER MAIN AT PROPOSED MANHOLE LOCATION. (SEE NOTE NO. 2)

CONDUCT TEST PIT IN ADVANCE TO VERIFY LOCATION AND ELEVATION OF EXIST. 8"ø LINED TR SEWER MAIN AT PROPOSED MANHOLE LOCATION. (SEE NOTE NO. 2.)

REMOVE AND RELOCATE EXIST. 6"ø SICPE CLAY DAM DRAIN OUTLET TO NEW CATCH BASIN. (SEE SHEET C-3.)

RECONSTRUCT AND PAVE EXIST. DRIVEWAY. (SEE SHEET C-3.) (ALTERNATE BID NO. 3)

EXTREME HIGH WATER EL. 10.50
MEAN HIGH WATER EL. 6.50
MEAN SEA LEVEL EL. 0.00
MEAN LOW WATER EL. -6.40

STILLMAN STREET

LINCOLN STREET

MAIN STREET (U.S. ROUTE 1)

MACHIAS RIVER

N/F KURZ

N/F PENNELL JR.

N/F STRACHAN

N/F TOWN OF MACHIAS

N/F ARISE ADDICTION RECOVERY, INC.

N/F MARKLEY/LILLEY

N/F BAR HARBOR BANKING AND TRUST

N/F YANG

N/F GATCOMB

N/F AMERICAN LEGION POST #9

N/F TOWN OF MACHIAS

EXIST. MAINE CENTRAL RAILROAD R/W SPUR

EXIST. 30' WIDE SEWER EASEMENT

EXIST. 20' WIDE SEWER EASEMENT

APPROX. LOCATION EXIST. WOOD CRIBWORK

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
PROFESSIONAL ENGINEER
LICENSED

NOTES:

1) COORDINATE ALL CIVIL WORK WITH STRUCTURAL, MECHANICAL, ELECTRICAL, AND HVAC SHEETS. ALL ELECTRICAL AND HVAC COMPONENTS NOT BEING REUSED SHALL BE DEMOLISHED.

2) CONTRACTOR SHALL CONDUCT TEST PITS IN ADVANCE AS NOTED AND TO FIELD VERIFY SIZE AND MATERIAL OF EXISTING PIPES PRIOR TO ORDERING STRUCTURES.

3) EXISTING CONCRETE SIPHON STRUCTURE AND TRIPLE 6"ø HDPE SIPHON RIVER CROSSING SHALL REMAIN OPERATIONAL THROUGHOUT DURATION OF PROJECT.

4) CONTRACTOR SHALL CONDUCT CONSTRUCTION ACTIVITIES WITH EXTREME CAUTION WITH RESPECT TO PROTECTING THE EXISTING SIPHON STRUCTURE AND SIPHON RIVER CROSSING PIPES FROM PLUGGING WITH ANY MATERIAL OR CONSTRUCTION DEBRIS. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADDITIONAL SCREENING IN THE SIPHON STRUCTURE DURING EXCAVATION AND INSTALLATION OF PROPOSED PIPING TO PROTECT EXISTING SIPHON STRUCTURE FROM TRENCHING ACTIVITIES. ANY TEMPORARY BY-PASS PUMPING SHALL BE DIVERTED TO AND THROUGH THE ADDITIONAL SCREENING MEASURES.

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

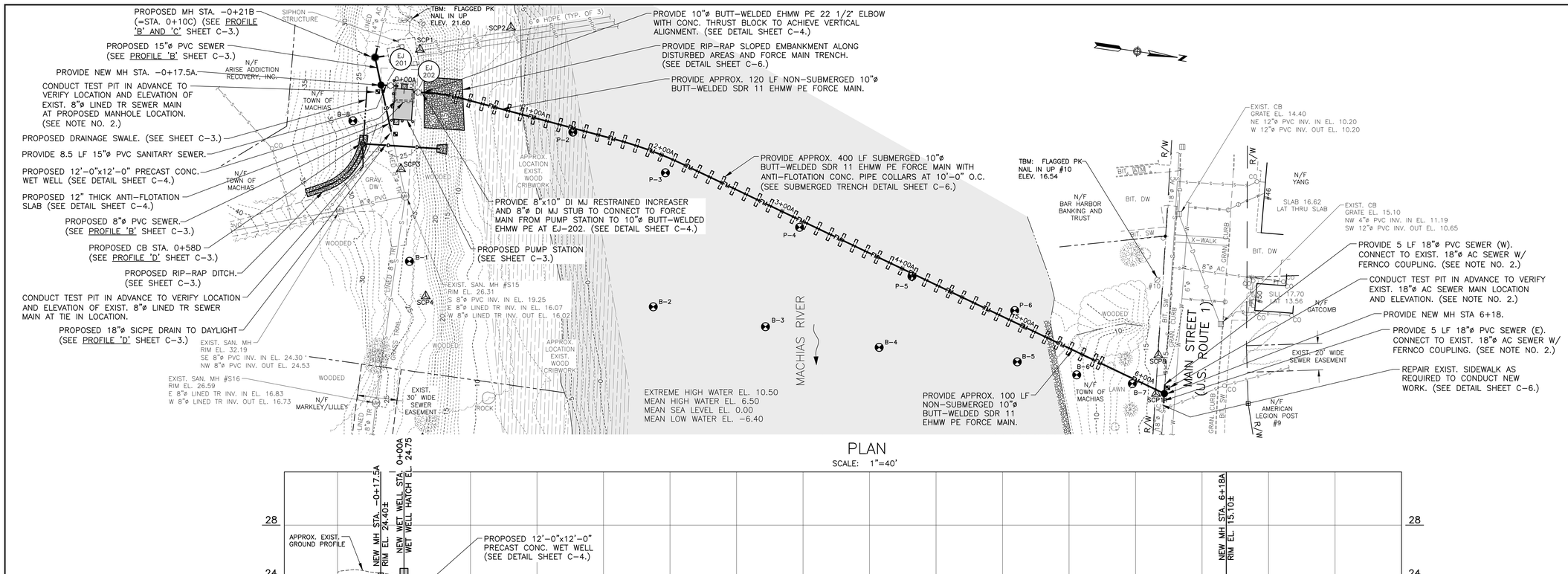
DES.BY: EWH	DR.BY: NWD/JAH	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION AND RIVER CROSSING EXISTING SITE PLAN

SCALE: 1" = 40'	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C-1



NOTES:

1) COORDINATE ALL CIVIL WORK WITH STRUCTURAL, MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

2) CONTRACTOR SHALL CONDUCT TEST PITS IN ADVANCE AS NOTED AND TO FIELD VERIFY SIZE AND MATERIAL OF EXISTING PIPES PRIOR TO ORDERING STRUCTURES.

3) EXISTING CONCRETE SIPHON STRUCTURE AND TRIPLE 6"ø HDPE SIPHON RIVER CROSSING SHALL REMAIN OPERATIONAL THROUGHOUT DURATION OF PROJECT.

4) CONTRACTOR SHALL CONDUCT CONSTRUCTION ACTIVITIES WITH EXTREME CAUTION WITH RESPECT TO PROTECTING THE EXISTING SIPHON STRUCTURE AND SIPHON RIVER CROSSING PIPES FROM PLUGGING WITH ANY MATERIAL OR CONSTRUCTION DEBRIS. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADDITIONAL SCREENING IN THE SIPHON STRUCTURE DURING EXCAVATION AND INSTALLATION OF PROPOSED PIPING TO PROTECT EXISTING SIPHON STRUCTURE FROM TRENCHING ACTIVITIES. ANY TEMPORARY BY−PASS PUMPING SHALL BE DIVERTED TO AND THROUGH THE ADDITIONAL SCREENING MEASURES.

STATE OF MAINE — ANNALEIS HAFFORD — No. 11562 — LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

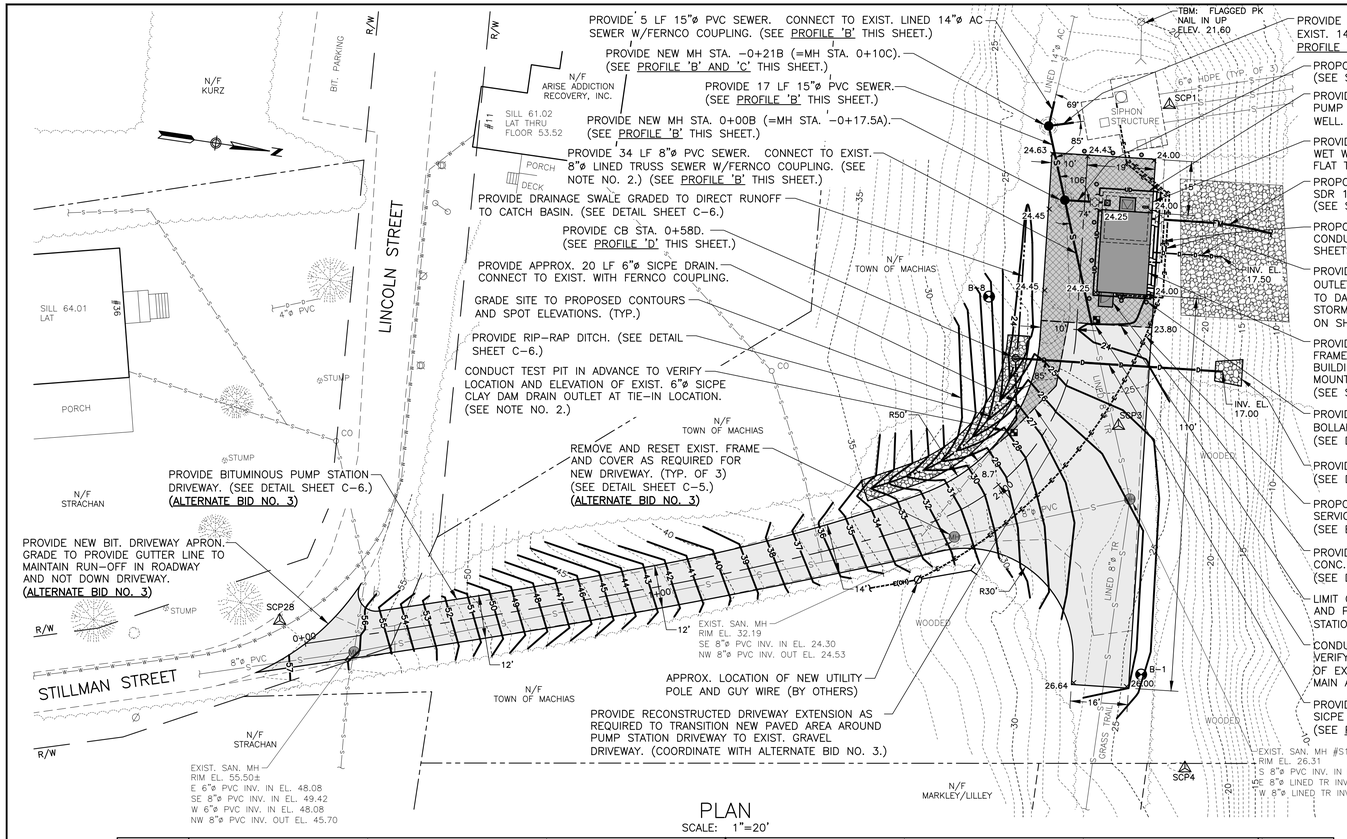
DES.BY: EWH	DR.BY: NWD/JAH	CK.BY: AH

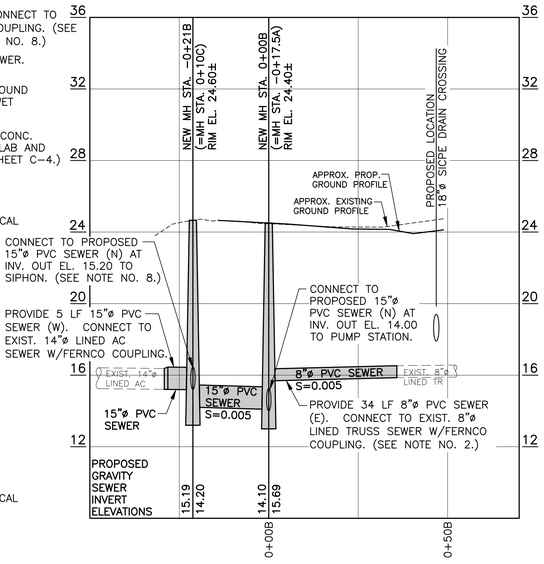
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION PROPOSED FORCE MAIN RIVER CROSSING PLAN AND PROFILE

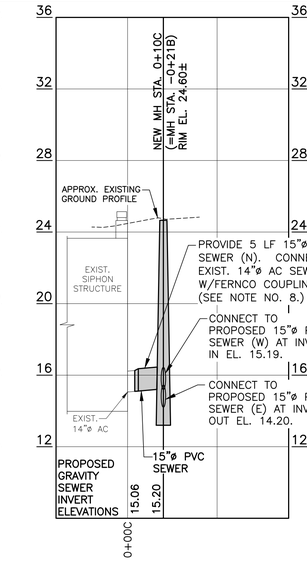
SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C−2





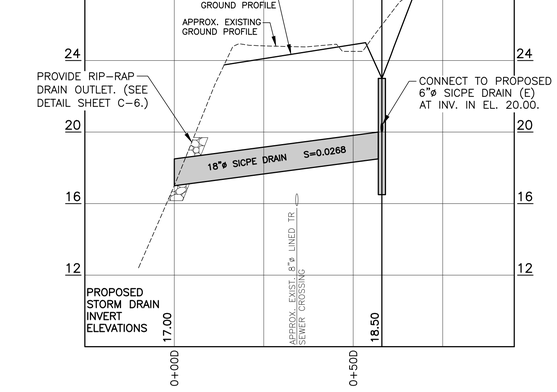
SEWER PROFILE 'B'

SCALE: 1"=20' HORIZ.
1"=4' VERT.



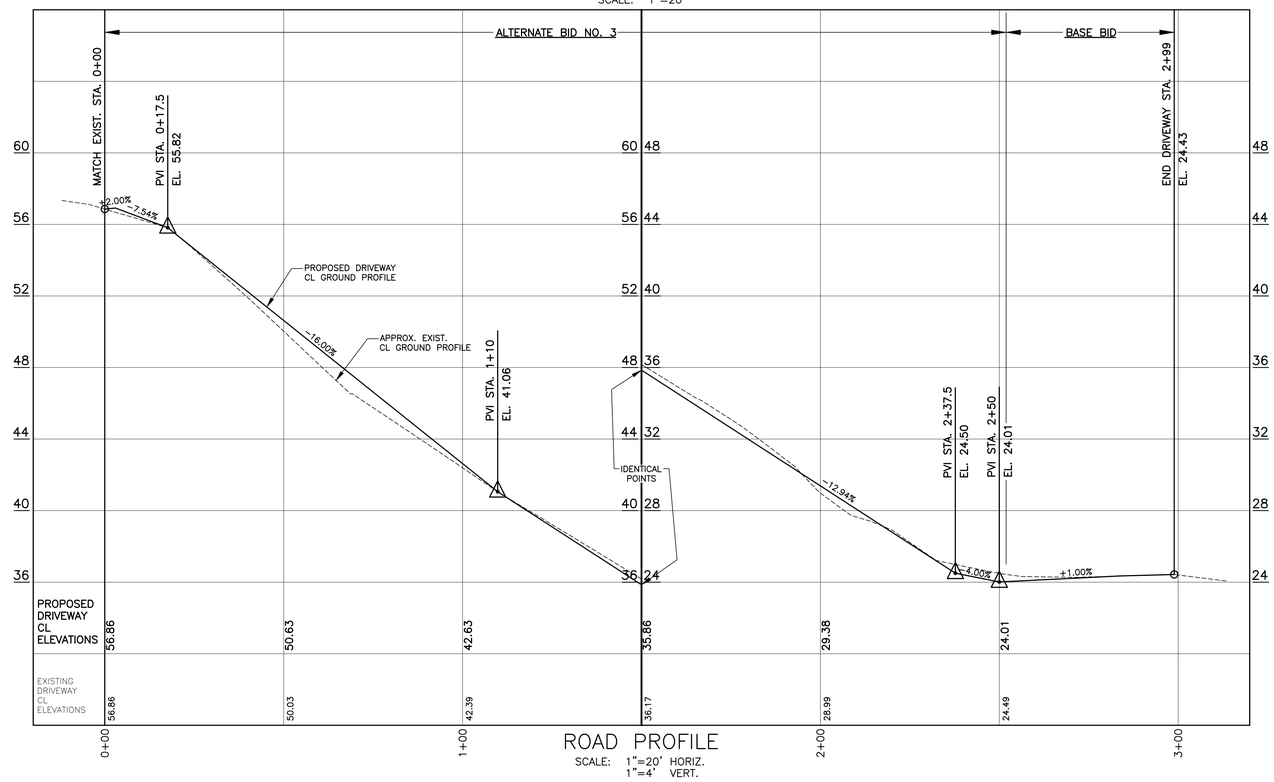
SEWER PROFILE 'C'

SCALE: 1"=20' HORIZ.
1"=4' VERT.



DRAIN PROFILE 'D'

SCALE: 1"=20' HORIZ.
1"=4' VERT.



ROAD PROFILE

SCALE: 1"=20' HORIZ.
1"=4' VERT.

NOTES:

1) COORDINATE ALL CIVIL WORK WITH STRUCTURAL, MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

2) CONTRACTOR SHALL CONDUCT TEST PIT IN ADVANCE AS NOTED AND TO FIELD VERIFY SIZE AND MATERIAL OF EXISTING PIPES PRIOR TO ORDERING STRUCTURES.

3) EXISTING CONCRETE SIPHON STRUCTURE TO REMAIN OPERATIONAL THROUGHOUT DURATION OF PROJECT.

4) CONTRACTOR SHALL CONDUCT CONSTRUCTION ACTIVITIES WITH EXTREME CAUTION WITH RESPECT TO PROTECTING THE EXISTING SIPHON STRUCTURE AND SIPHON RIVER CROSSING PIPES FROM PLUGGING WITH ANY MATERIAL OR CONSTRUCTION DEBRIS. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADDITIONAL SCREENING IN THE SIPHON STRUCTURE DURING EXCAVATION AND INSTALLATION OF PROPOSED PIPING TO PROTECT EXISTING SIPHON STRUCTURE FROM TRENCHING ACTIVITIES. ANY TEMPORARY BY−PASS PUMPING SHALL BE DIVERTED TO AND THROUGH THE ADDITIONAL SCREENING MEASURES.

5) CONTRACTOR SHALL COORDINATE NEW DRIVEWAY IMPROVEMENTS TO MAINTAIN ACCESS TO EXISTING SIPHON BY OWNER AT ALL TIMES.

6) ALL NEW DRIVEWAY AREAS SHALL BE CONSTRUCTED WITH 12" AGGREGATE SUB−BASE, 6" AGGREGATE BASE, 2 1/2" OF BIT. BINDER AND 1 1/2" OF BIT. SURFACE PAVEMENT. (SEE DETAIL SHEET C−6.)

7) REVEGETATE ALL DISTURBED AREAS WITH 4" LOAM, HYDROSEED, AND MULCH UNLESS OTHERWISE INDICATED.

8) DESIGN INTENT IS FOR EXISTING SIPHON STRUCTURE AND TRIPLE 6"ø HPDE SIPHON RIVER CROSSING TO REMAIN AS A BACK−UP SYSYEM AT COMPLETION AND ACTIVATION OF THE NEW PUMP STATION. CONTRACTOR SHALL FLUSH AND CLEAN EXISTING 6"ø HDPE RIVER CROSSING PIPES AND EXISTING SIPHON STRUCTURE AT COMPLETION OF PROJECT IN PREPARATION FOR USE AS A BACK−UP SYSTEM.

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

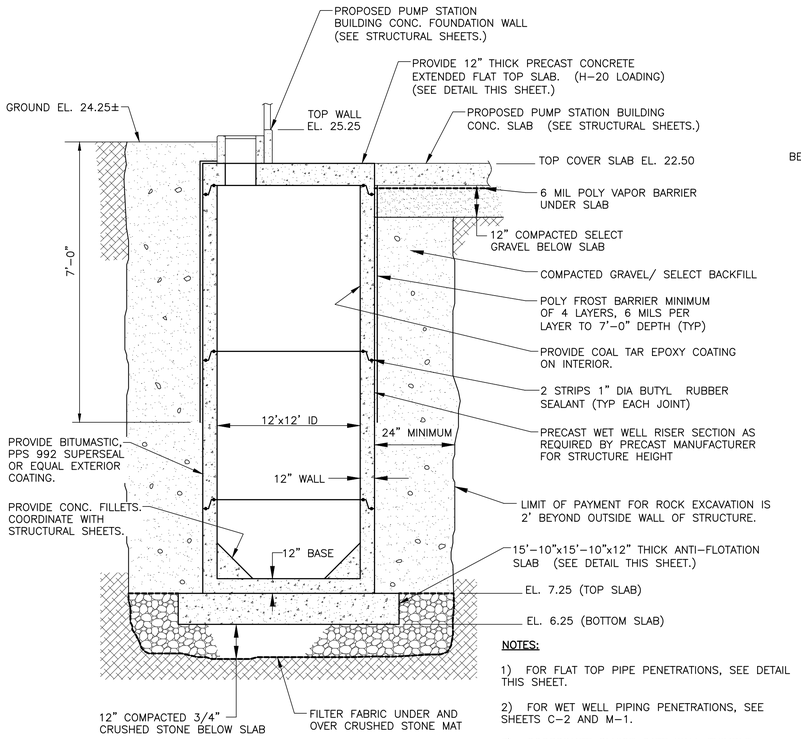
DES.BY: NWD/EWH	DR.BY: NWD/JAH	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION PROPOSED SITE PLAN AND PROFILES

SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C−3



NOTES:

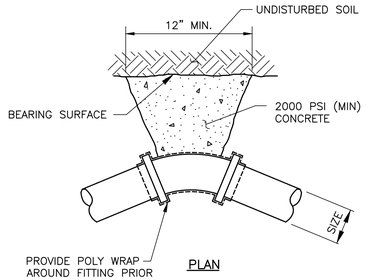
1) FOR FLAT TOP PIPE PENETRATIONS, SEE DETAIL THIS SHEET.

2) FOR WET WELL PIPING PENETRATIONS, SEE SHEETS C-2 AND M-1.

3) COORDINATE SLUICE GATE WALL THIMBLE PROVIDED BY SLUICE GATE MANUFACTURER WITH PRECAST MANUFACTURER. (SEE MECHANICAL SHEETS.)

4) PROVIDE INTERIOR AND EXTERIOR COATINGS. COORDINATE WITH SPECIFICATION SECTION 02720.

PRECAST WET WELL DETAIL



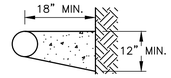
PLAN

NOTES:

1) THRUST BLOCK CONFIGURATION SHALL BE APPROX. SQUARE AT BEARING SURFACE, THEN TRANSITION IN DEPTH AND WIDTH TO PIPE, 12"x 12" MINIMUM AT BEARING SURFACE AND 18" MINIMUM DEPTH.

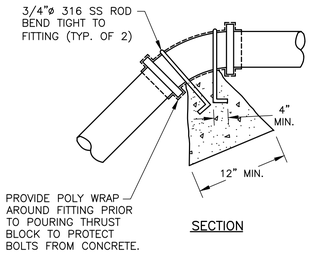
2) THRUST BLOCKS ARE REQUIRED AT ALL CHANGES OF DIRECTION AND FITTINGS IN PRESSURIZED FORCE MAINS.

	BEARING SURFACE, FT²			
SIZE, IN	TEE, 90°	45°	22 1/2°	11 1/4°
4/6	2.6	1.4	1.0	1.0
8	4.6	2.5	1.4	1.0
10	7.2	3.9	2.0	1.0



SECTION

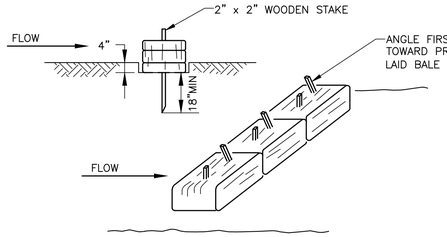
HORIZONTAL THRUST BLOCK



SECTION

VERTICAL THRUST BLOCK

THRUST BLOCK DETAIL

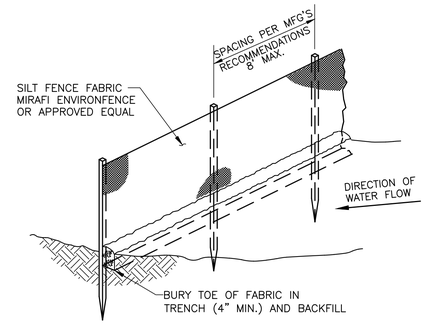


HAY BALE BARRIER DETAIL

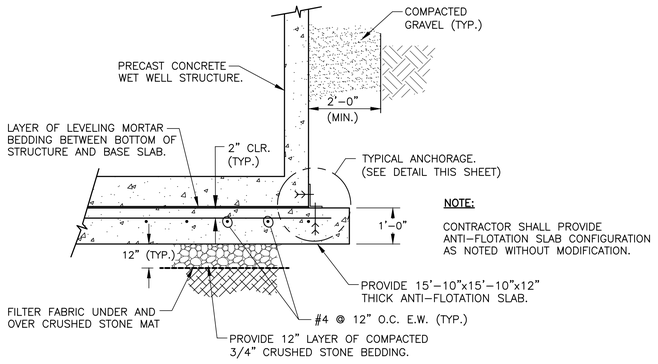
EROSION CONTROL NOTES

EROSION CONTROL DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE CARRIED OUT UTILIZING THE FOLLOWING MEASURES AND IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION.

1. HAY BALES AND/OR SILT FENCES SHALL BE INSTALLED AS SHOWN ON THIS PLAN AND ON THE "DOWNSTREAM" SLOPE OF ALL CONSTRUCTION AREAS PRIOR TO THE START OF CONSTRUCTION IN THAT AREA. UTILIZE HAY BALES AS NECESSARY TO RESTRICT SOIL TRANSPORT DURING DITCH RESHAPING. TEMPORARY EROSION CONTROL BARRIERS SHALL BE MAINTAINED UNTIL PERMANENT GROUND PROTECTION IS ESTABLISHED.
2. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED IN SUCH A MANNER THAT THE LEAST PRACTICAL AMOUNT OF SOIL IS DISTURBED THAT CANNOT HAVE PERMANENT EROSION CONTROL MEASURES APPLIED IMMEDIATELY.
3. ALL DISTURBED SURFACES SHALL BE LOAMED AND SEEDED IMMEDIATELY AFTER FINAL GRADING IS COMPLETED.
4. ALL DISTURBED SURFACES NOT BEING FINAL GRADED SHALL BE MULCHED WITH HAY OR STRAW AT 46 LBS. PER 1000 SQ. FT. (2 TONS PER ACRE) OR STABILIZED WITH EROSION CONTROL MAT (ANTI-WASH/GEOJUTE OR EQUAL).
5. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES AFTER EVERY RAINFALL OR A MINIMUM OF ONCE A WEEK AND PERFORM ANY NECESSARY MAINTENANCE OF THESE MEASURES. MAINTENANCE PROCEDURES FOR EROSION CONTROL MEASURES INCLUDE:
   A. REPAIRING ANY BARRIERS WHICH HAVE BECOME INEFFECTIVE OR DISLODGED.
   B. REPLACING ANY BARRIER WHICH HAS DETERIORATED OR BECOME INEFFECTIVE.
   C. REMOVING SEDIMENT DEPOSITS FROM THE BARRIERS WHEN THE DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.



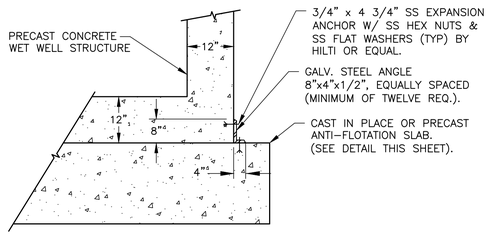
SILT FENCE DETAIL



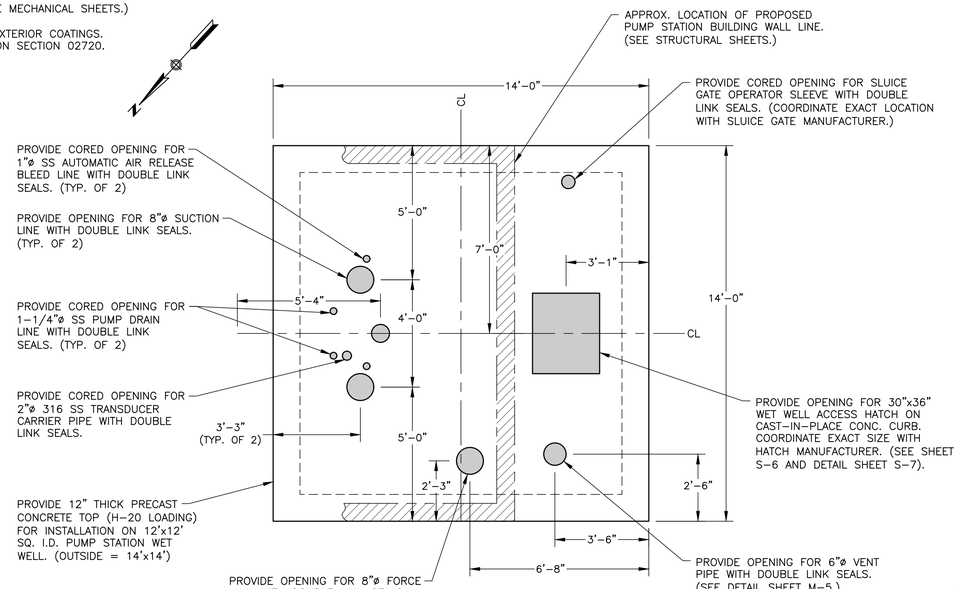
NOTE:

CONTRACTOR SHALL PROVIDE ANTI-FLOTATION SLAB CONFIGURATION AS NOTED WITHOUT MODIFICATION.

ANTI-FLOTATION SLAB DETAIL



TYPICAL ANCHORAGE DETAIL



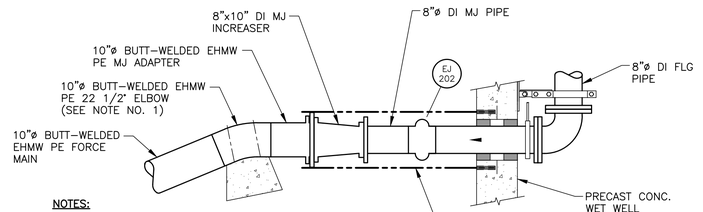
NOTES:

1) CAST OR CORE ALL OPENINGS FOR SERVICE LINES AND LINK SEALS.

2) COORDINATE EXACT SIZE AND LOCATION OF ALL PIPE PENETRATIONS AND PUMP STATION ANCHORING ON SITE WITH ACTUAL EQUIPMENT LAYOUT. CONFIGURATION SHOWN INDICATES APPROXIMATE LAYOUT FOR BIDDING PURPOSES.

3) DOUBLE LINK SEAL ALL PENETRATIONS FOR GAS-TIGHT FIT WHERE CONCRETE THICKNESS ALLOWS.

PUMP STATION WET WELL FLAT TOP DETAIL



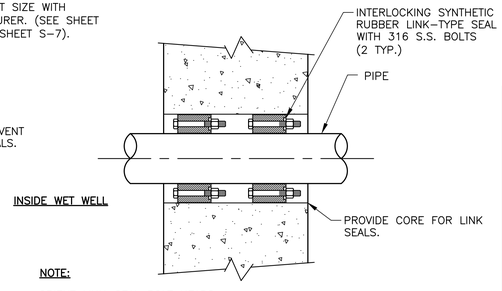
NOTES:

1) CONCRETE THRUST BLOCK REQUIRED AT ELBOW. (SEE DETAIL THIS SHEET.)

2) FULLY RESTRAIN THE FORCE MAIN WITH 3/4"ø 316 SS THREADED ROD, DUCT LUGS OR TIE BOLTS, AND ALL NECESSARY ACCESSORIES. ANCHOR TO PRECAST CONCRETE WET WELL WITH HILTI HVU2 OR EQUAL ADHESIVE ANCHORS.

SECTION

FORCE MAIN CONNECTION DETAIL



INSIDE WET WELL

NOTE:

ORIENT LINK-SEAL BOLT HEADS TO BE ACCESSIBLE FOR FUTURE REMOVAL.

WET WELL PENETRATION DETAIL

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

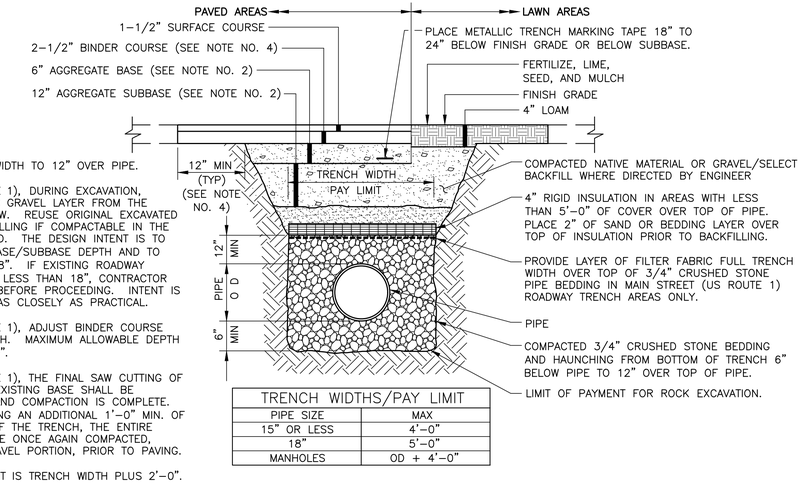
DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

CIVIL DETAILS

SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C-4



TRENCH WIDTHS/PAY LIMIT	
PIPE SIZE	MAX
15" OR LESS	4'-0"
18"	5'-0"
MANHOLES	OD + 4'-0"

NOTES:

1) MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.

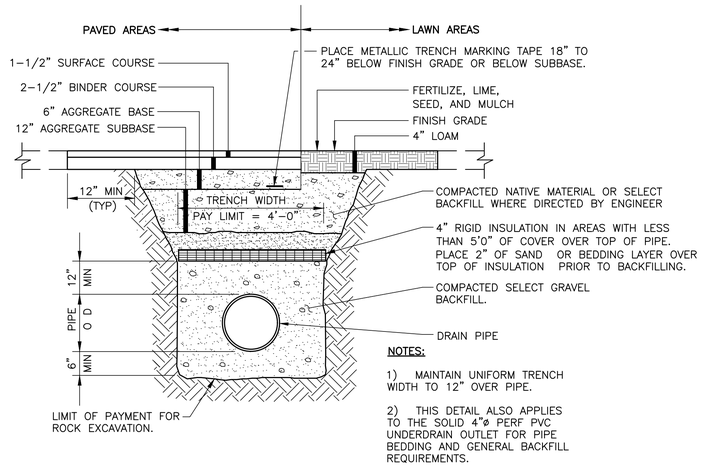
2) ON MAIN STREET (US ROUTE 1), DURING EXCAVATION, SEPARATE THE EXISTING ROADBED GRAVEL LAYER FROM THE NATIVE TRENCH EXCAVATION BELOW. REUSE ORIGINAL EXCAVATED NATIVE MATERIALS DURING BACKFILLING IF COMPACTABLE IN THE ORDER THAT THEY WERE REMOVED. THE DESIGN INTENT IS TO MATCH THE EXISTING ROADWAY BASE/SUBBASE DEPTH AND TO PROVIDE A MINIMUM DEPTH OF 18". IF EXISTING ROADWAY BASE/SUBBASE DEPTHS ARE ARE LESS THAN 18", CONTRACTOR SHALL CONSULT WITH ENGINEER BEFORE PROCEEDING. INTENT IS TO MATCH EXISTING CONDITIONS AS CLOSELY AS PRACTICAL.

3) ON MAIN STREET (US ROUTE 1), ADJUST BINDER COURSE PAVEMENT TO MATCH EXIST. DEPTH. MAXIMUM ALLOWABLE DEPTH OF ANY PAVEMENT LIFT IS 2 1/2".

4) ON MAIN STREET (US ROUTE 1), THE FINAL SAW CUTTING OF PAVEMENT TO THE TOP OF THE EXISTING BASE SHALL BE PERFORMED AFTER BACKFILLING AND COMPACTION IS COMPLETE. AFTER SAW CUTTING AND REMOVING AN ADDITIONAL 1'-0" MIN. OF PAVEMENT BEYOND EACH EDGE OF THE TRENCH, THE ENTIRE EXPOSED GRAVEL LAYER SHALL BE ONCE AGAIN COMPACTED, INCLUDING THE UNDISTURBED GRAVEL PORTION, PRIOR TO PAVING.

5) TRENCH PAVEMENT PAY LIMIT IS TRENCH WIDTH PLUS 2'-0".

TYPICAL SEWER/FORCE MAIN TRENCH DETAIL

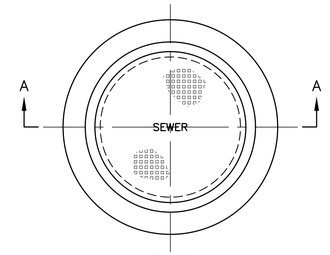


NOTES:

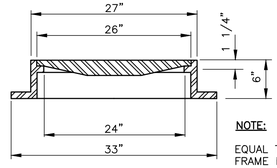
1) MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.

2) THIS DETAIL ALSO APPLIES TO THE SOLID 4"ø PERF PVC UNDERDRAIN OUTLET FOR PIPE BEDDING AND GENERAL BACKFILL REQUIREMENTS.

STORM DRAIN TRENCH DETAIL



PLAN

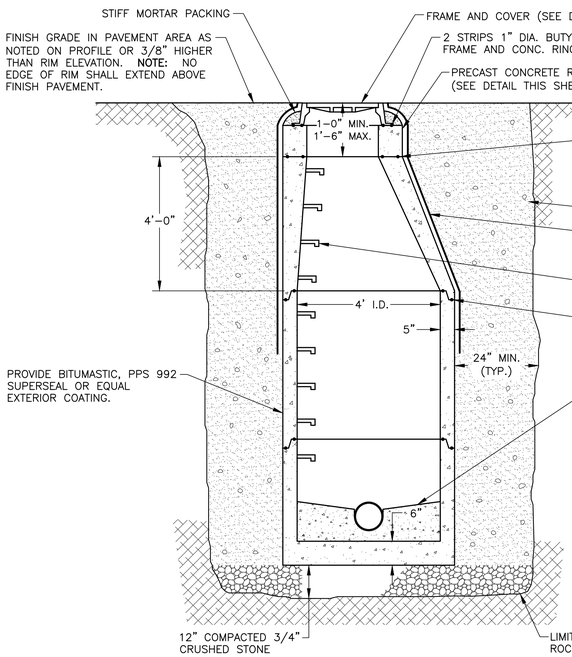


SECTION A-A

NOTE:

EQUAL TO EAST JORDAN IRON WORKS FRAME NO. 2266Z AND COVER NO. 2110A 1 BY E.J. PRESCOTT, INC.

MANHOLE FRAME AND COVER DETAIL

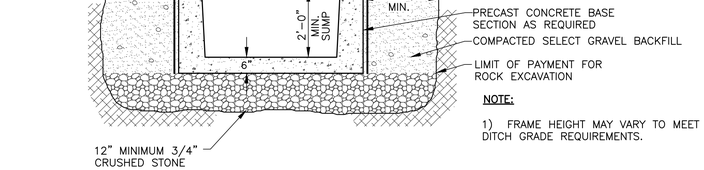


NOTES:

1) SEE PROFILE FOR ELEVATIONS OF RIM RELATIVE TO PAVEMENT AREA FINISH GRADES.

2) MANHOLE PAVEMENT PAY LIMIT FOR MAIN STREET (US ROUTE 1) IS 11'-0"x11'-0".

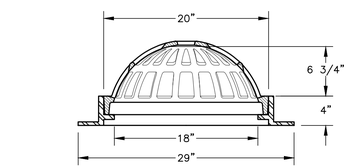
PRECAST MANHOLE DETAIL



NOTE:

1) FRAME HEIGHT MAY VARY TO MEET FINAL DITCH GRADE REQUIREMENTS.

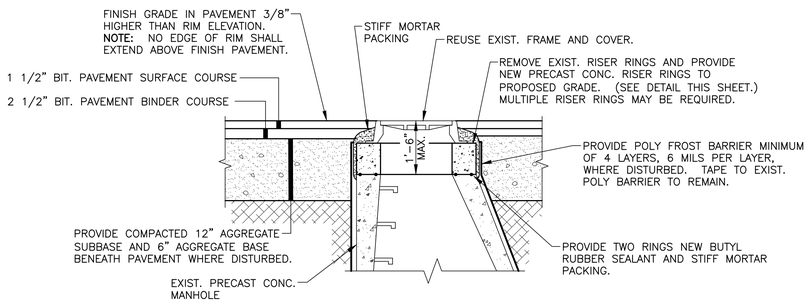
TYPICAL CATCH BASIN DETAIL



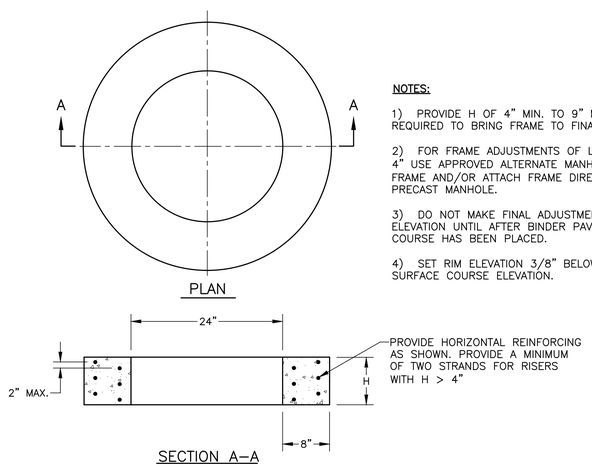
NOTE:

EQUAL TO NEENAH FOUNDRY R-1566 CAST IRON FRAME AND R-4351-CW CAST IRON BEEHIVE GRATE.

BEEHIVE CATCH BASIN FRAME AND GRATE DETAIL



PRECAST MANHOLE RAISING DETAIL



NOTES:

1) PROVIDE H OF 4" MIN. TO 9" MAX. AS REQUIRED TO BRING FRAME TO FINAL GRADE.

2) FOR FRAME ADJUSTMENTS OF LESS THAN 4" USE APPROVED ALTERNATE MANHOLE FRAME AND/OR ATTACH FRAME DIRECTLY TO PRECAST MANHOLE.

3) DO NOT MAKE FINAL ADJUSTMENT OF RIM ELEVATION UNTIL AFTER BINDER PAVEMENT COURSE HAS BEEN PLACED.

4) SET RIM ELEVATION 3/8" BELOW FINAL SURFACE COURSE ELEVATION.

PRECAST CONCRETE GRADE RINGS DETAIL

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

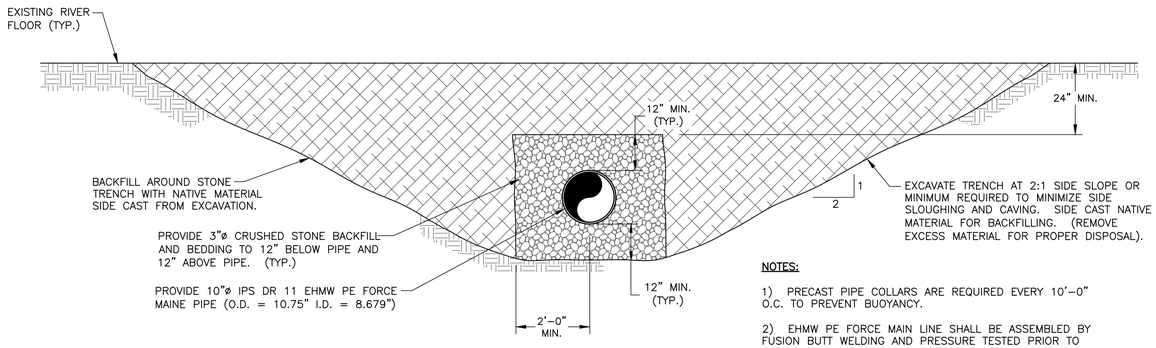
DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

CIVIL DETAILS

SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C-5

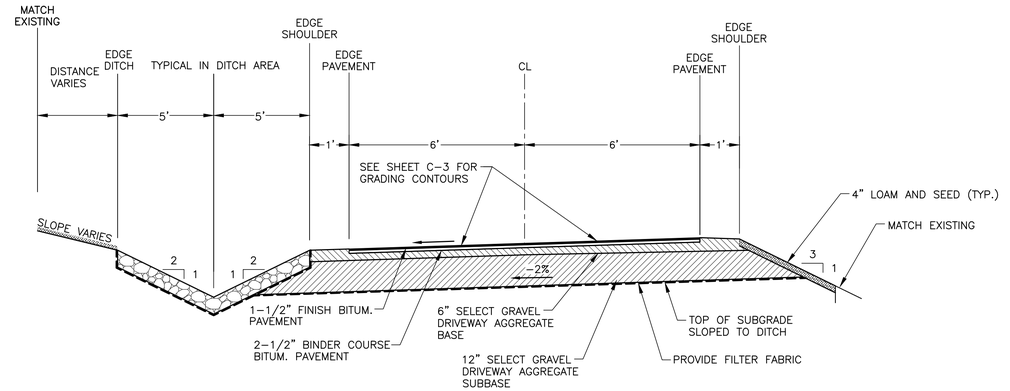


NOTES:

1) PRECAST PIPE COLLARS ARE REQUIRED EVERY 10'-0" O.C. TO PREVENT BUOYANCY.

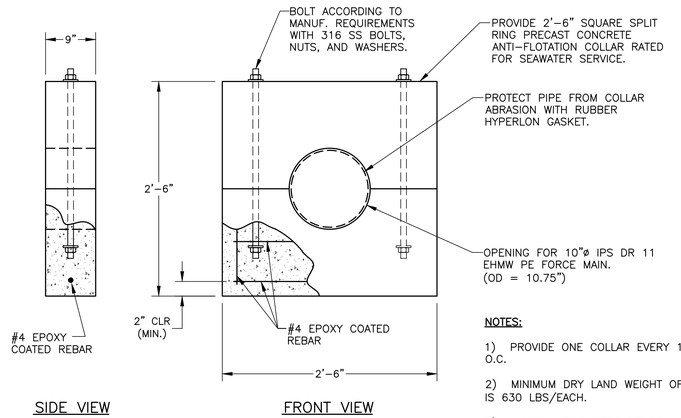
2) EHMW PE FORCE MAIN LINE SHALL BE ASSEMBLED BY FUSION BUTT WELDING AND PRESSURE TESTED PRIOR TO INSTALLING IN TRENCH.

SUBMERGED FORCE MAIN RIVER CROSSING TRENCH DETAIL



TYPICAL PUMP STATION DRIVEWAY CONSTRUCTION DETAIL

(ALTERNATE BID NO. 3)



NOTES:

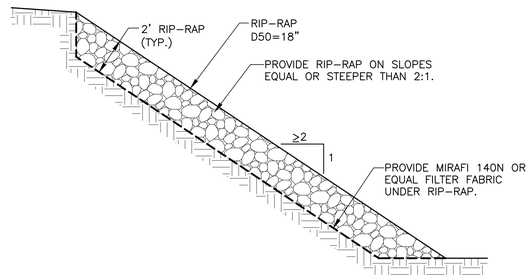
1) PROVIDE ONE COLLAR EVERY 10'-0" O.C.

2) MINIMUM DRY LAND WEIGHT OF COLLAR IS 630 LBS/EACH.

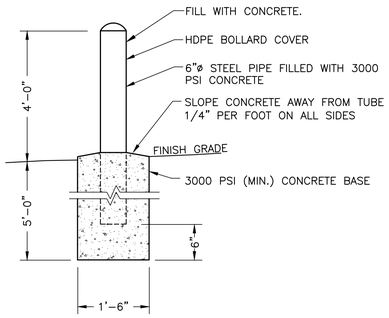
3) MINIMUM THICKNESS OF COLLAR IS 9".

4) CONCRETE SHALL BE FOR SEAWATER CONTACT. COORDINATE WITH SPECIFICATION SECTION 03300.

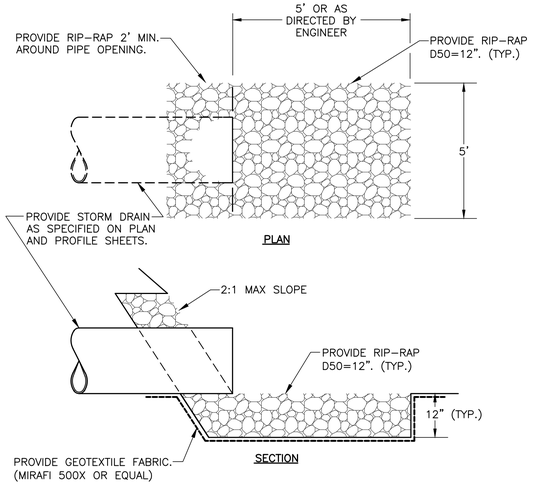
PRECAST ANTI-FLOTATION SQUARE COLLAR DETAIL



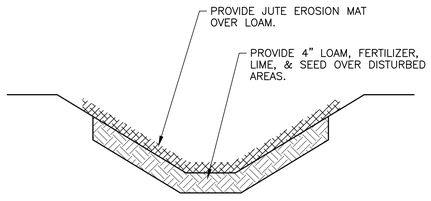
RIP-RAP SIDESLOPE DETAIL



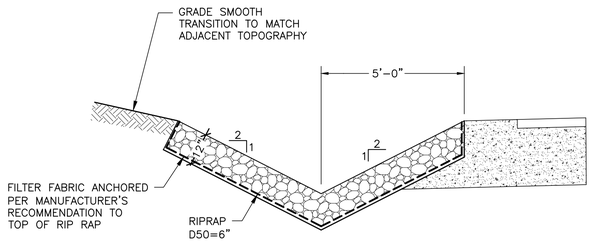
CONCRETE FILLED PIPE BOLLARD DETAIL



CULVERT RIP-RAP DETAIL



TYPICAL DRAINAGE SWALE DETAIL



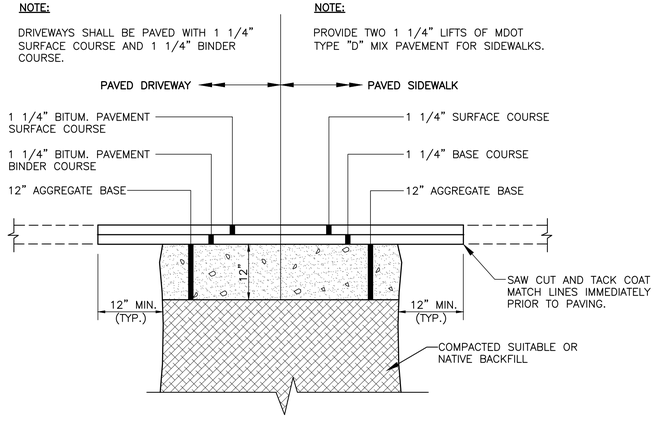
RIP-RAP DITCH DETAIL

NOTE:

DRIVEWAYS SHALL BE PAVED WITH 1 1/4" SURFACE COURSE AND 1 1/4" BINDER COURSE.

NOTE:

PROVIDE TWO 1 1/4" LIFTS OF MDOT TYPE "D" MIX PAVEMENT FOR SIDEWALKS.



TYPICAL BITUMINOUS DRIVEWAY AND SIDEWALK REPAIR DETAIL

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

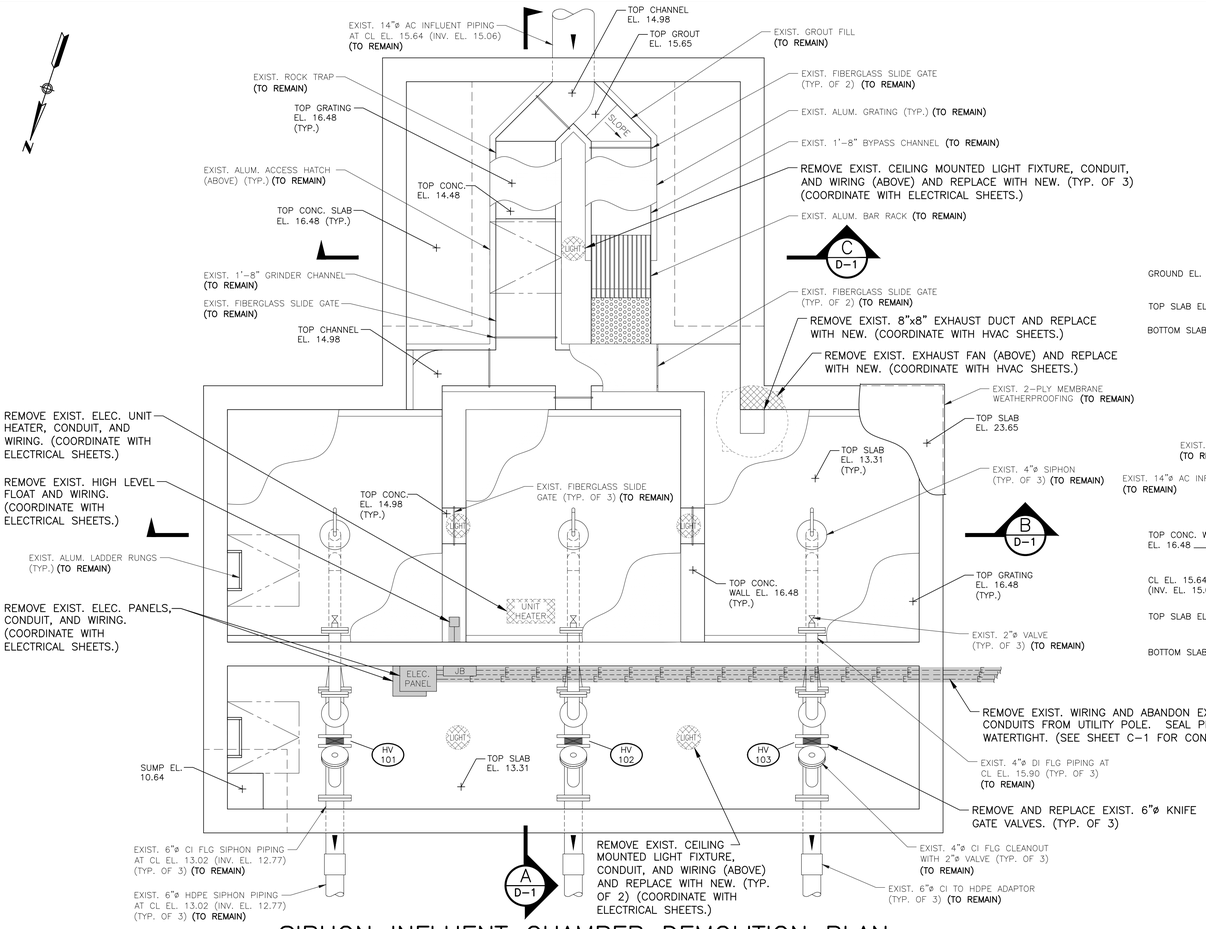
DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

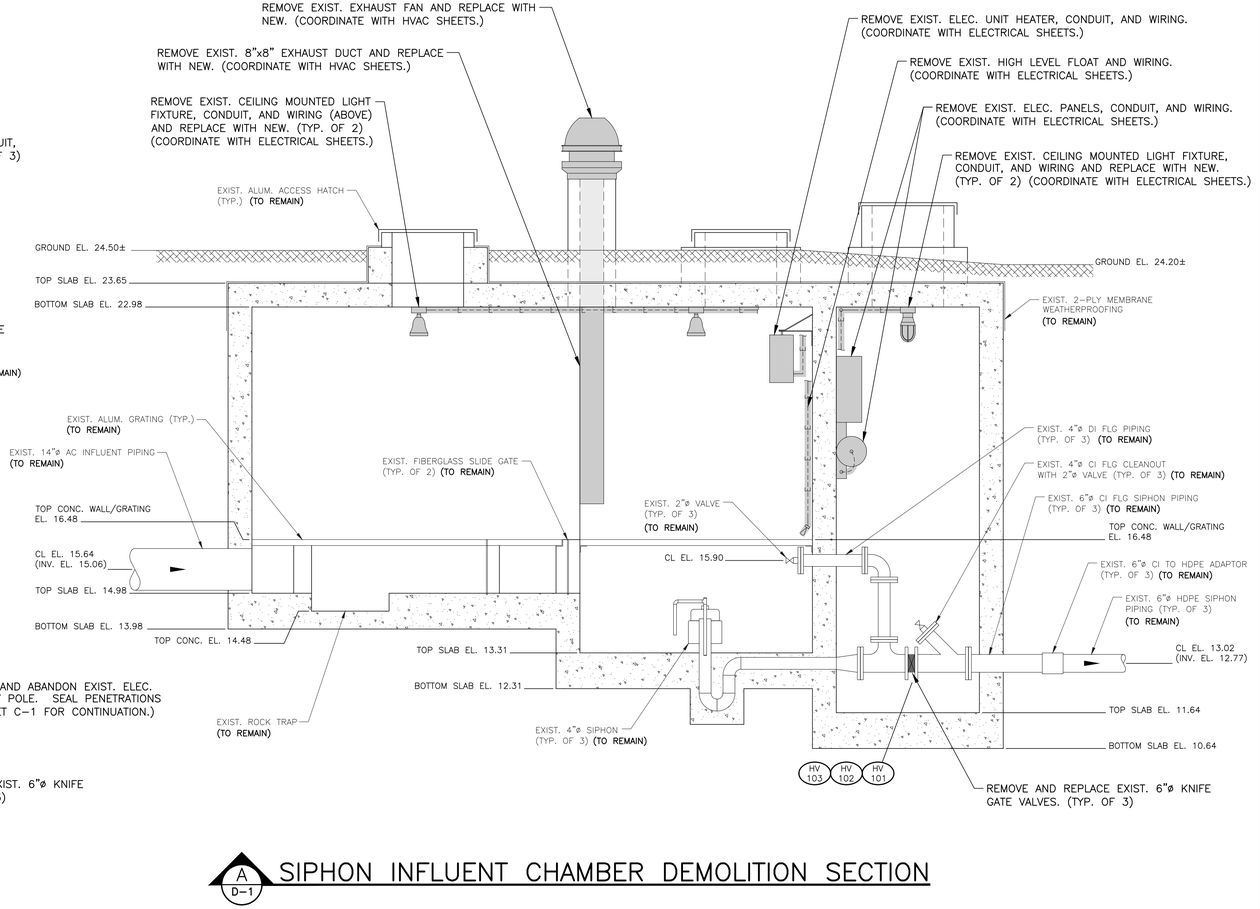
SOUTH SIDE PUMP STATION INSTALLATION

CIVIL DETAILS

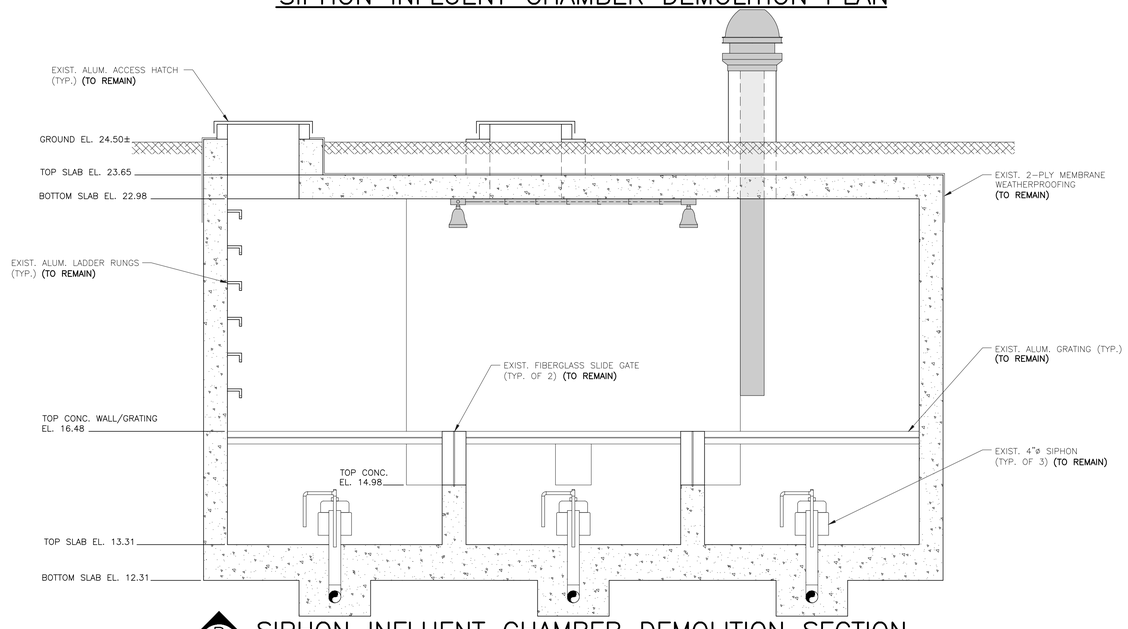
SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: C-6



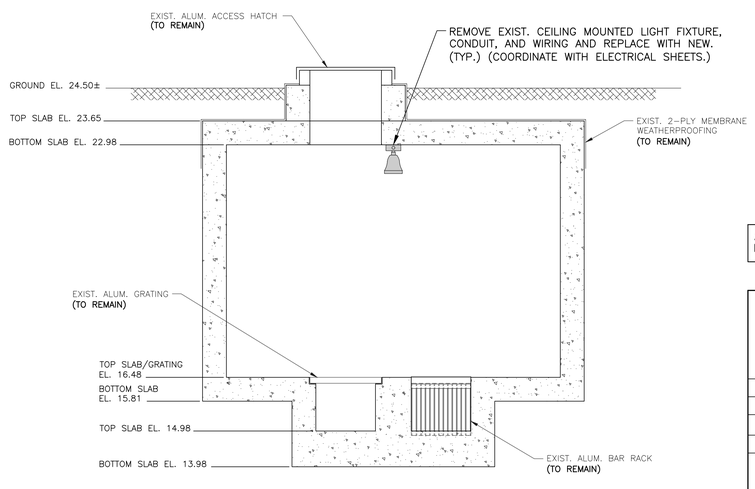
SIPHON INFLUENT CHAMBER DEMOLITION PLAN



A D-1 SIPHON INFLUENT CHAMBER DEMOLITION SECTION



B D-1 SIPHON INFLUENT CHAMBER DEMOLITION SECTION



C D-1 SIPHON INFLUENT CHAMBER DEMOLITION SECTION

NOTES:

1) COORDINATE ALL DEMOLITION WORK WITH ELECTRICAL AND HVAC SHEETS.

2) SOME ITEMS SHOWN OUT OF PHASE FOR CLARITY.

ALL WORK SHOWN ON THIS DRAWING IS PART OF ALTERNATE BID NO. 2.

STATE OF MAINE ★ ANNALEIS HAFFORD No. 11562 LICENSED PROFESSIONAL ENGINEER ★

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

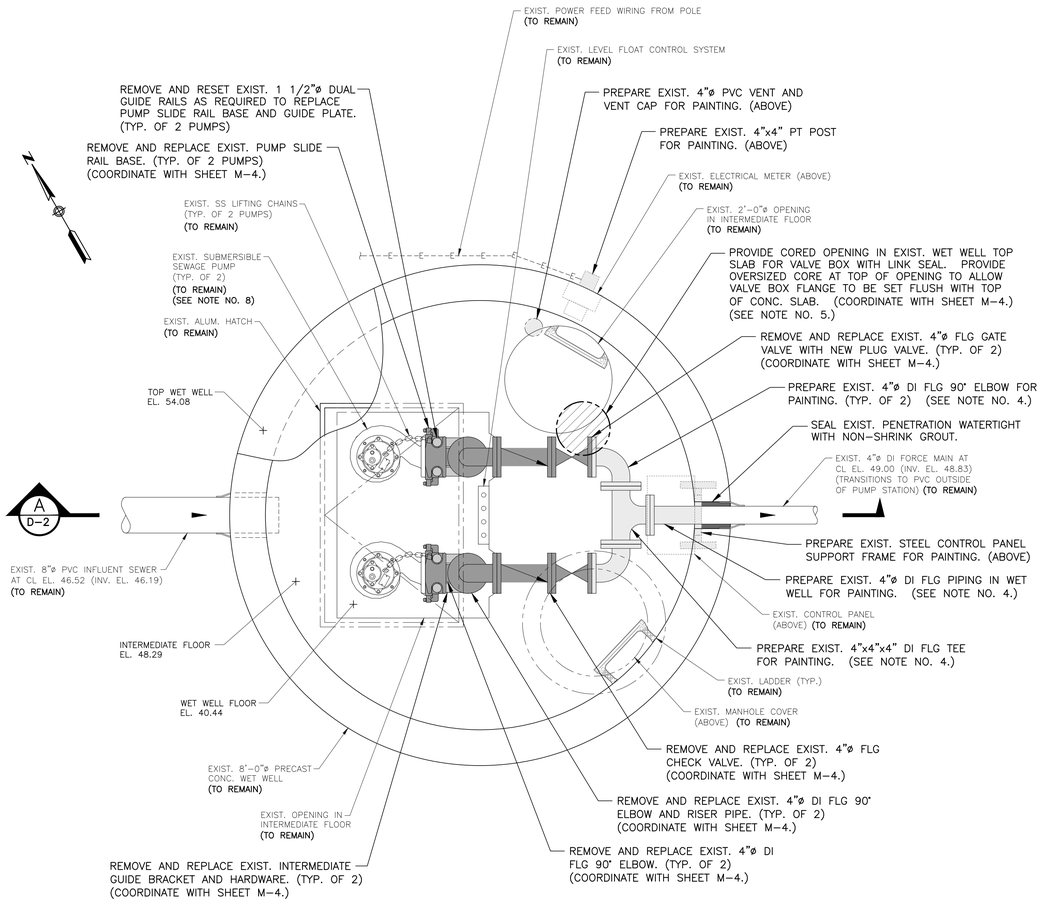
DES.BY: EWH	DR.BY: NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

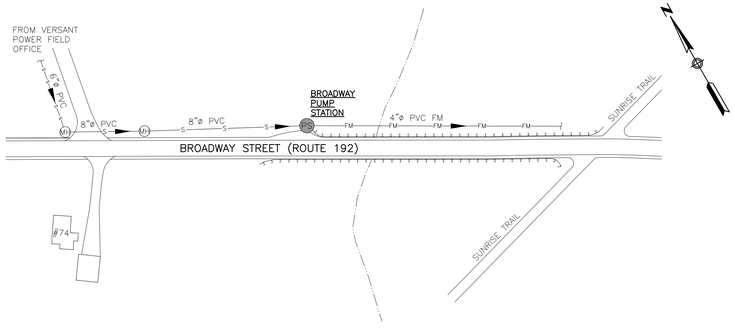
SIPHON INFLUENT CHAMBER DEMOLITION PLAN AND SECTIONS (ALTERNATE BID NO. 2)

SCALE: 1/2" = 1'-0"	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: D-1



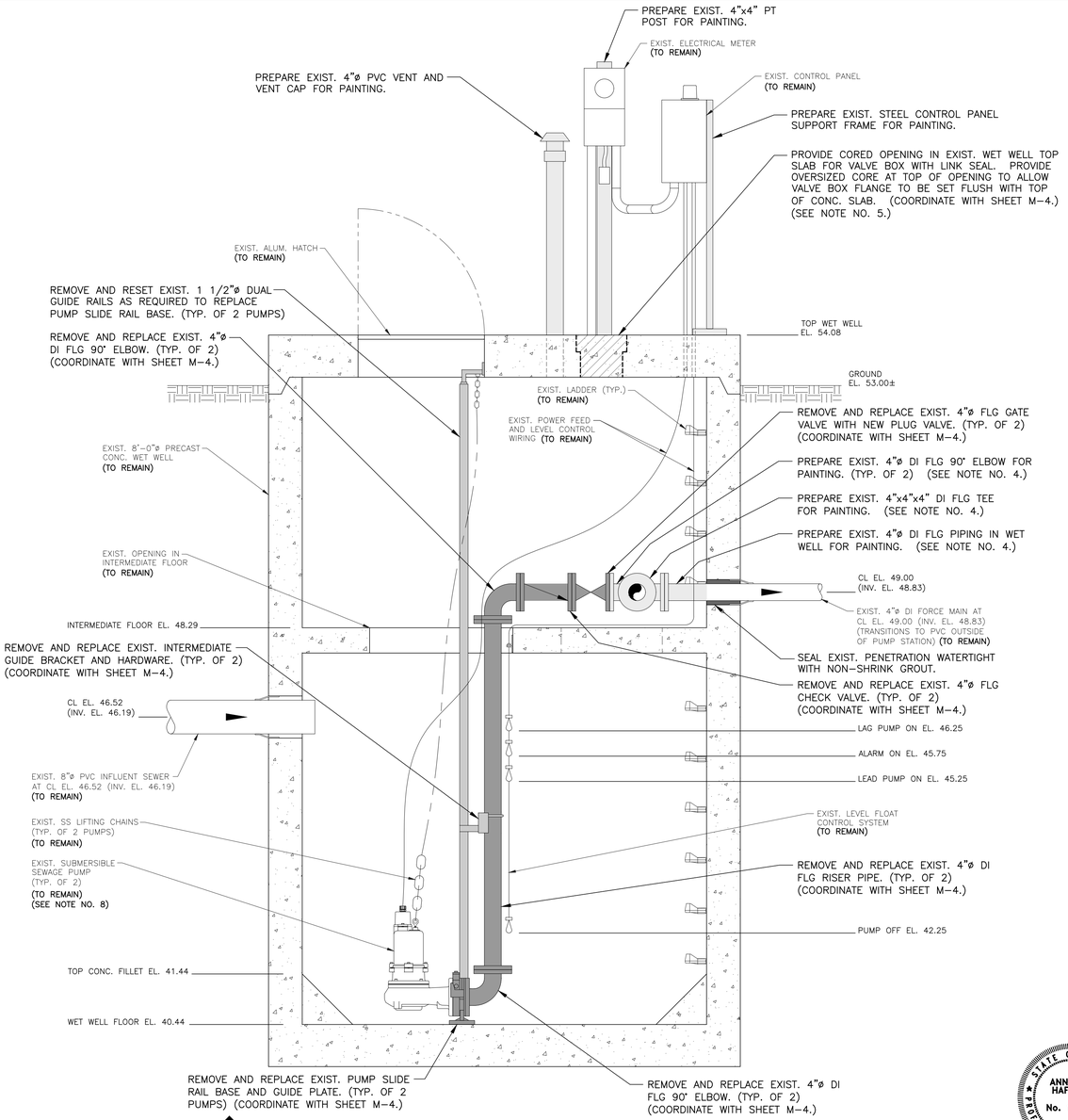
BROADWAY PUMP STATION DEMOLITION PLAN

SCALE: 3/4" = 1'-0"



BROADWAY PUMP STATION LOCATION PLAN

SCALE: 1" = 100'



A D-2 BROADWAY PUMP STATION DEMOLITION SECTION

SCALE: 3/4" = 1'-0"

NOTES:

1) INFORMATION ON THIS SHEET PROVIDED IN PART BY:

BANGOR HYDRO ELECTRIC CO. DIVISION SERVICE CENTER SANITARY SEWER SYSTEM BY CES, INC. DATED SEPTEMBER, 1996.

BANGOR HYDRO MACHIAS, MAINE BY AMERICAN CONCRETE IND. DATED MAY, 1997.

2) CONTRACTOR SHALL PROVIDE SEPTIC TRUCK BY-PASS PUMPING AS REQUIRED TO CONDUCT WORK. THE EXISTING PUMP CAPACITY IS 100 GPM @25 TDH AND THE AVERAGE PUMP RUN TIME DURING DRY WEATHER IS 0.70 HOURS/WEEK.

3) COORDINATE ALL DEMOLITION WORK WITH MECHANICAL SHEETS.

4) PREPARE FOR PAINTING ALL EXISTING WET WELL PIPING DESIGNATED TO REMAIN ACCORDING TO SPECIFICATIONS AND PAINT ALL NEW AND EXISTING PIPING, VALVES, AND FITTINGS.

5) ALL HOLES CORES THROUGH EXISTING REINFORCED CONCRETE SHALL BE COATED WITH A 10 MIL LAYER OF SIKA FERROGARD 903 OR EQUAL GROUT TO PROTECT REBAR.

6) SOME ITEMS SHOWN OUT OF PHASE FOR CLARITY.

7) CONTRACTOR SHALL VACUUM AND PRESSURE WASH CLEAN EXISTING WET WELL AND REMOVE AND DISPOSE OF MATERIAL REMOVED FROM WET WELL AT LICENSED FACILITY.

8) TEMPORARILY REMOVE AND RESET EXIST. PUMPS TO ACCOMMODATE NEW WORK.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
PROFESSIONAL ENGINEER
LICENSED

ALL WORK SHOWN ON THIS DRAWING IS PART OF ALTERNATE BID NO. 1.

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

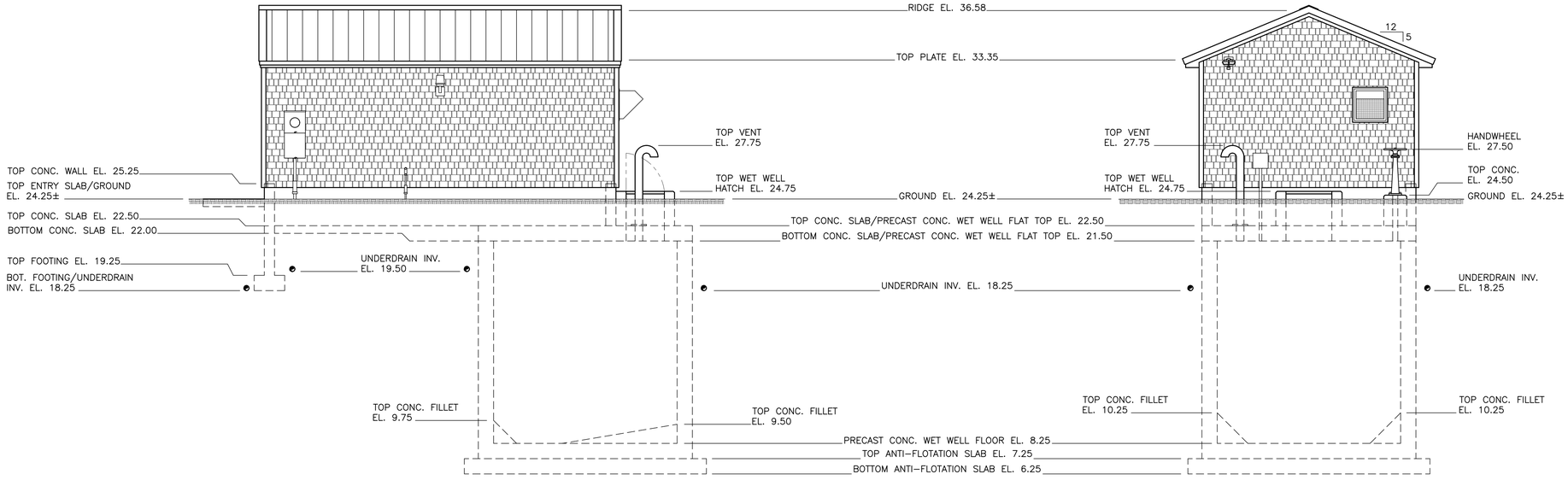
DES.BY: NWD	DR.BY: NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

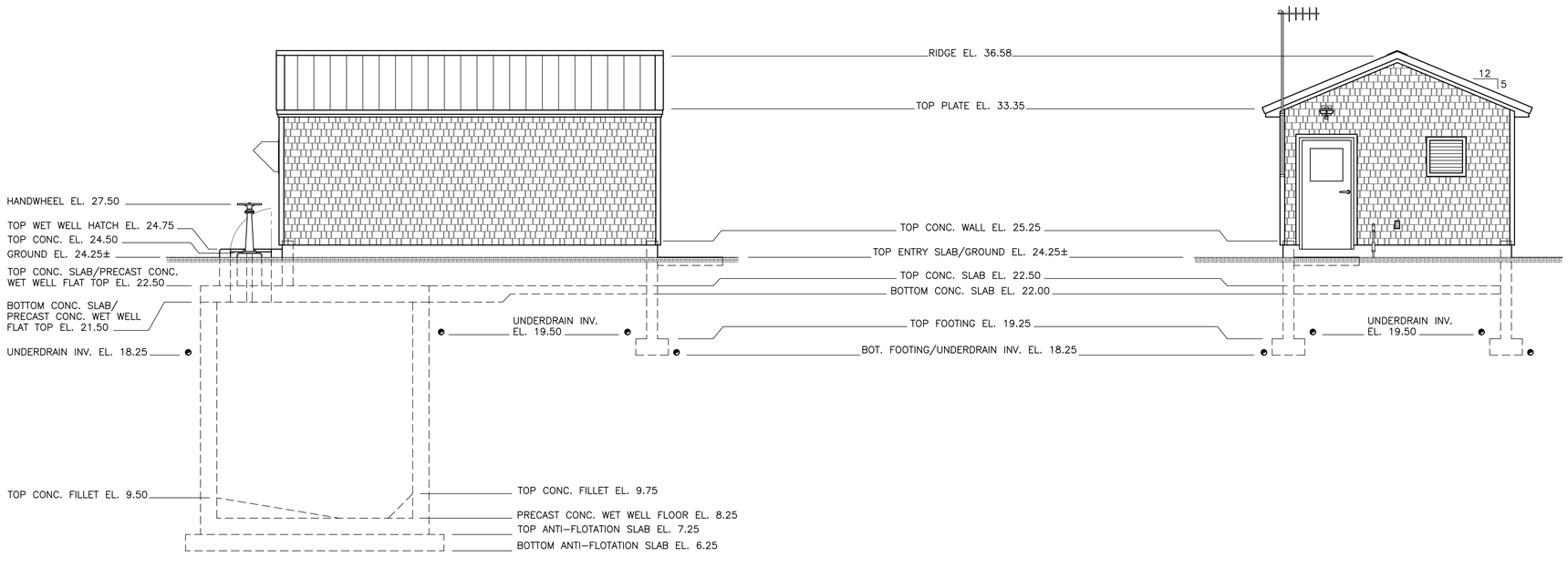
BROADWAY PUMP STATION DEMOLITION PLAN AND SECTION (ALTERNATE BID NO. 1)

SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: D-2



NORTH ELEVATION

WEST ELEVATION



SOUTH ELEVATION

EAST ELEVATION

NOTES:

1) PAINT ENTRY DOOR ACCORDING TO SPECIFICATIONS.

2) ALL INTERIOR TRIM SHALL BE 1"X4" PVC UNLESS OTHERWISE NOTED. ALL EXTERIOR TRIM SHALL BE ALUM. CLAD.

3) INSULATE ALL BUILDING CORNERS.

4) USE TRIPLE DIPPED GALVANIZED OR SS FASTENERS ON ALL PRESSURE TREATED WOOD.

5) FRAME, TRIM AND PROVIDE 1'-4"X2'-0" PLYWOOD CEILING ATTIC ACCESS.

6) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY TRUSS BRACING DURING CONSTRUCTION IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

7) SEE SHEET S-8 FOR TRUSS DETAIL AND LOADING CAPACITIES.

8) COORDINATE SLAB AND WALL PENETRATIONS WITH MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

9) SEE SHEET C-3 FOR BUILDING LOCATION AND GRADING.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

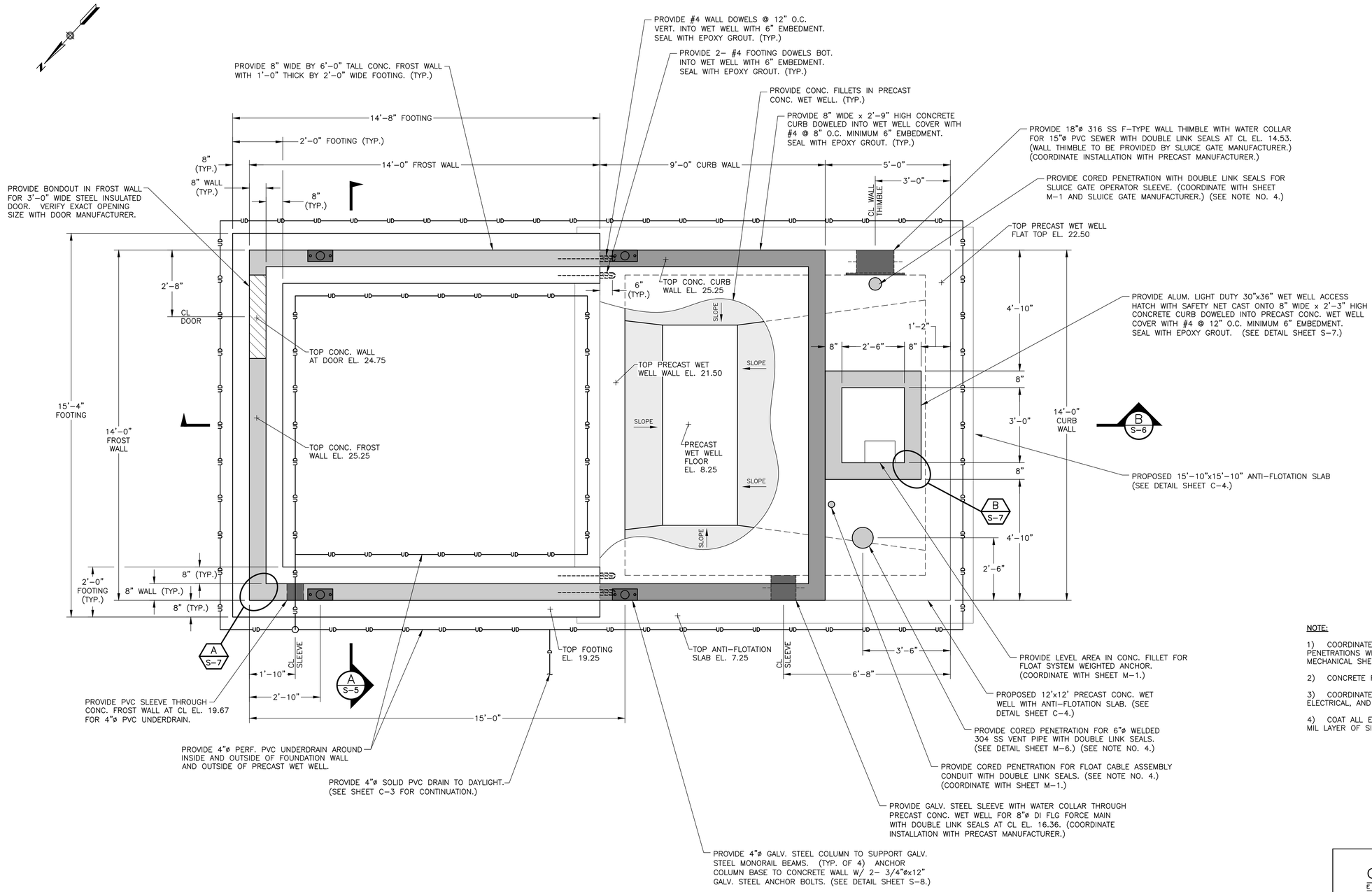
DES.BY: NWD/EWH	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION STRUCTURAL ELEVATIONS

SCALE: 1/4" = 1'-0"	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: S-1



NOTE:

1) COORDINATE EXACT SIZE AND LOCATION OF PUMP STATION PENETRATIONS WITH PUMP STATION MANUFACTURER AND MECHANICAL SHEETS PRIOR TO CORING SLAB.

2) CONCRETE FLOOR SHALL BE TREATED WITH HARDENER. (TYP.)

3) COORDINATE SLAB AND WALL PENETRATIONS WITH MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

4) COAT ALL EXPOSED REBAR FROM CORING TOP SLAB WITH 10 MIL LAYER OF SIKA FERROGARD 903 OR EQUAL EPOXY GROUT.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH | DR.BY: JAH/NWD | CK.BY: AH

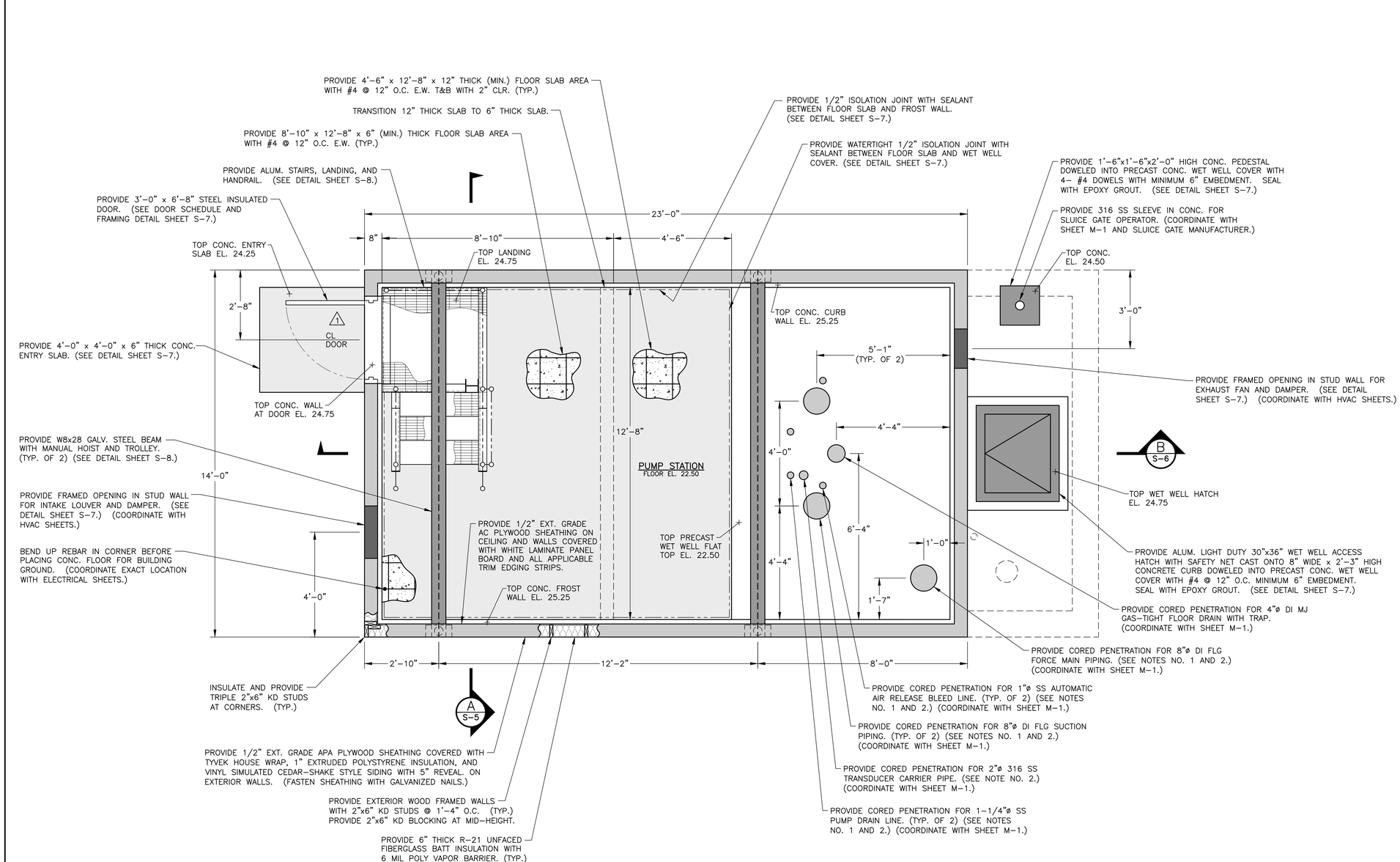
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION FOUNDATION STRUCTURAL PLAN

SCALE: 1/2" = 1'–0" | PROJECT NO.: 2260

DATE: OCTOBER, 2022 | SHEET: S–2



NOTE:

1) COORDINATE EXACT SIZE AND LOCATION OF PUMP STATION PENETRATIONS WITH PUMP STATION MANUFACTURER AND MECHANICAL SHEETS PRIOR TO CORING SLAB.

2) COAT ALL EXPOSED REBAR FROM CORING TOP SLAB WITH 10 MIL LAYER OF SIKA FERROGARD 903 OR EQUAL EPOXY GROUT.

3) PAINT ENTRY DOOR IN ACCORDANCE WITH SPECIFICATIONS.

4) DOUBLE LINK SEAL ALL PIPING PENETRATIONS FOR GAS TIGHT FIT.

5) CONCRETE FLOOR SHALL BE TREATED WITH HARDENER. (TYP.)

6) ALL INTERIOR TRIM SHALL BE 1"x4" PVC UNLESS OTHERWISE NOTED. ALL EXTERIOR TRIM SHALL BE ALUM. CLAD.

7) INSULATE ALL BUILDING CORNERS.

8) USE TRIPLE DIPPED GALVANIZED FASTENERS ON ALL PRESSURE TREATED WOOD.

9) COORDINATE SLAB AND WALL PENETRATIONS WITH MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

10) COORDINATE AND PROVIDE ADDITIONAL BLOCKING AND FRAMING AS REQUIRED FOR MOUNTING MECHANICAL AND ELECTRICAL EQUIPMENT.

STATE OF MAINE
ANNALEIS HAFFORD
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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH | DR.BY: JAH/NWD | CK.BY: AH

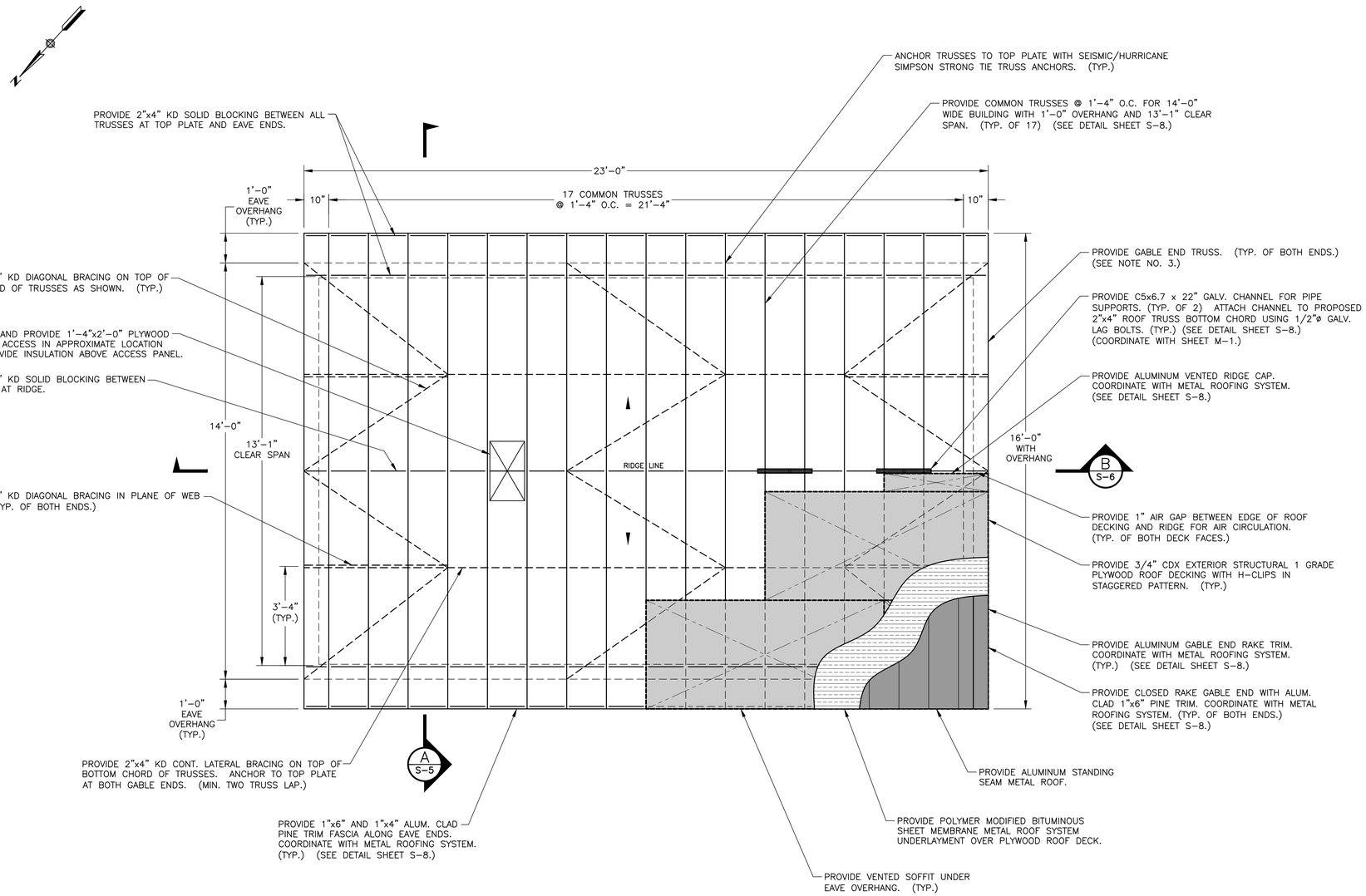
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION STRUCTURAL FLOOR PLAN

SCALE: 1/2" = 1'–0" | PROJECT NO.: 2260

DATE: OCTOBER, 2022 | SHEET: S–3



NOTES:

1) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY TRUSS BRACING DURING CONSTRUCTION IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

2) SEE SHEET S-8 FOR TRUSS DETAIL AND LOADING REQUIREMENTS.

3) GABLE END TRUSS TO BE SET ON AND FASTENED TO 2"x8" PLATE ON TOP OF 2"x6" WALL DOUBLE TOP PLATE TO ACCOMMODATE EXTERIOR RIGID INSULATION ON WALL BELOW. SEE SECTION B ON SHEET S-6 FOR FURTHER DETAIL.

STATE OF MAINE
ANNALEIS HAFFORD
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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH | DR.BY: JAH/NWD | CK.BY: AH

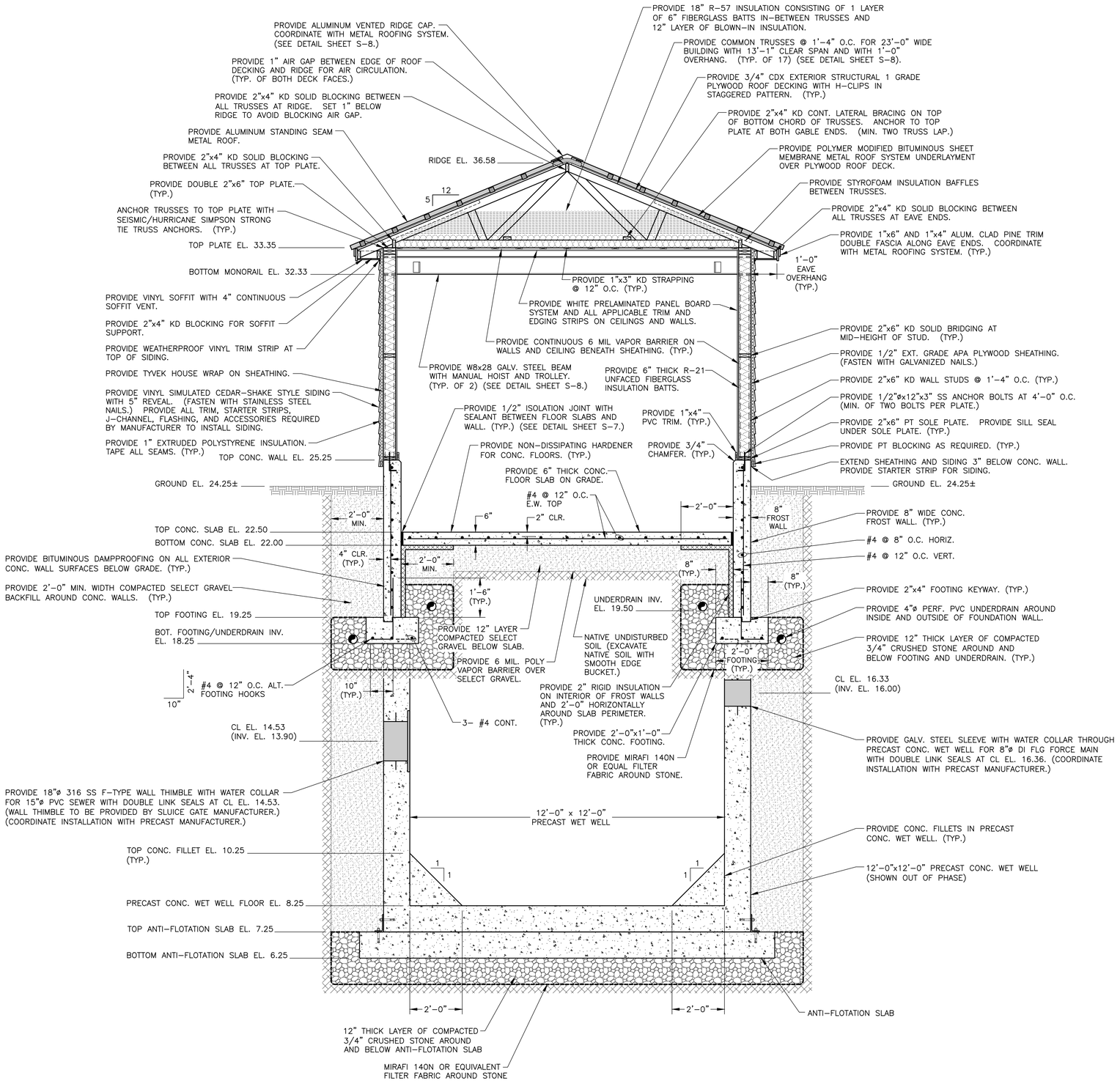
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION STRUCTURAL ROOF FRAMING PLAN

SCALE: 1/2" = 1'-0" | PROJECT NO.: 2260

DATE: OCTOBER, 2022 | SHEET: S-4



A
S-2/S-3/S-4

PUMP STATION STRUCTURAL SECTION

NOTE:

1) CONCRETE FLOOR SHALL BE TREATED WITH HARDENER. (TYP.)

2) COORDINATE SLAB AND WALL PENETRATIONS WITH MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

3) PAINT ENTRY DOOR IN ACCORDANCE WITH SPECIFICATIONS.

4) ALL INTERIOR TRIM SHALL BE 1"x4" PVC UNLESS OTHERWISE NOTED. ALL EXTERIOR TRIM SHALL BE ALUM. CLAD.

5) INSULATE ALL BUILDING CORNERS.

6) USE TRIPLE DIPPED GALVANIZED OR SS FASTENERS ON ALL PRESSURE TREATED WOOD.

7) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY TRUSS BRACING DURING CONSTRUCTION IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

8) SEE SHEET S-8 FOR TRUSS DETAIL AND LOADING REQUIREMENTS.

9) SOME ELEMENTS SHOWN OUT OF PHASE FOR CLARITY.

10) COORDINATE AND PROVIDE ADDITIONAL BLOCKING AND FRAMING AS REQUIRED FOR MOUNTING MECHANICAL AND ELECTRICAL EQUIPMENT.

STATE OF MAINE
ANNALEIS HAFFORD
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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH | DR.BY: JAH/NWD | CK.BY: AH

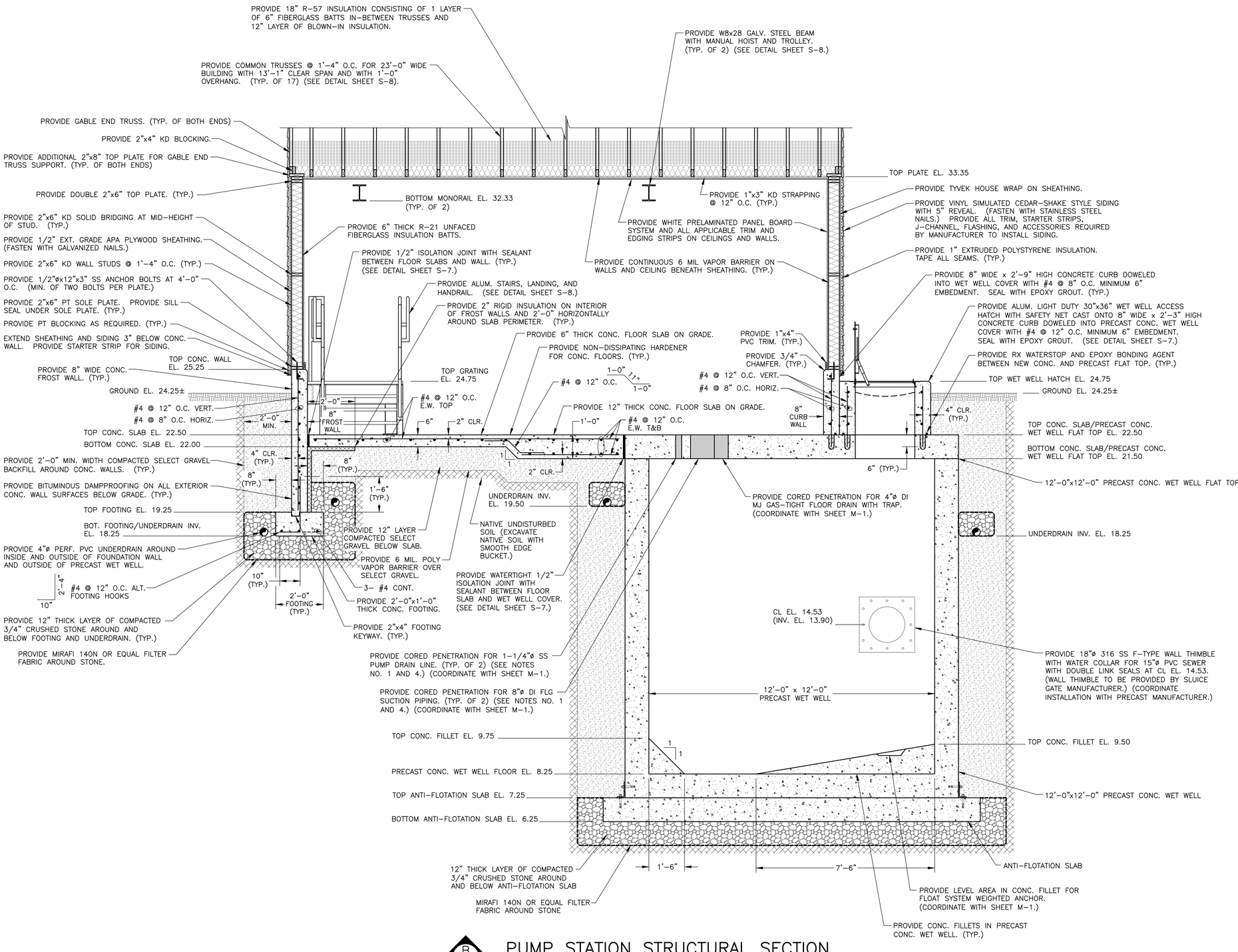
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION STRUCTURAL SECTION

SCALE: 1/2" = 1'-0" | PROJECT NO.: 2260

DATE: OCTOBER, 2022 | SHEET: S-5



B S-2/S-3/S-4 PUMP STATION STRUCTURAL SECTION

NOTE:

1) COORDINATE EXACT SIZE AND LOCATION OF PUMP STATION PENETRATIONS WITH PUMP STATION MANUFACTURER AND MECHANICAL SHEETS PRIOR TO CORING SLAB.

2) CONCRETE FLOOR SHALL BE TREATED WITH HARDENER. (TYP.)

3) COORDINATE SLAB AND WALL PENETRATIONS WITH MECHANICAL, ELECTRICAL, AND HVAC SHEETS.

4) COAT ALL EXPOSED REBAR FROM CORING TOP SLAB WITH 10 MIL LAYER OF SIKA FERROGARD 903 OR EQUAL EPOXY GROUT.

5) DOUBLE LINK SEAL ALL PIPING PENETRATIONS FOR GAS TIGHT FIT.

6) PAINT ENTRY DOOR IN ACCORDANCE WITH SPECIFICATIONS.

7) ALL INTERIOR TRIM SHALL BE 1"x4" PVC UNLESS OTHERWISE NOTED. ALL EXTERIOR TRIM SHALL BE ALUM. CLAD.

8) INSULATE ALL BUILDING CORNERS.

9) USE TRIPLE DIPPED GALVANIZED OR SS FASTENERS ON ALL PRESSURE TREATED WOOD.

10) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY TRUSS BRACING DURING CONSTRUCTION IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

11) SEE SHEET S-8 FOR TRUSS DETAIL AND LOADING REQUIREMENTS.

12) GABLE END TRUSS TO BE SET ON AND FASTENED TO 2"x8" PLATE ON TOP OF 2"x6" WALL DOUBLE TOP PLATE TO ACCOMMODATE EXTERIOR RIGID INSULATION ON WALL BELOW.

13) SOME ELEMENTS SHOWN OUT OF PHASE FOR CLARITY.

14) COORDINATE AND PROVIDE ADDITIONAL BLOCKING AND FRAMING AS REQUIRED FOR MOUNTING MECHANICAL AND ELECTRICAL EQUIPMENT.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH | DR.BY: JAH/NWD | CK.BY: AH

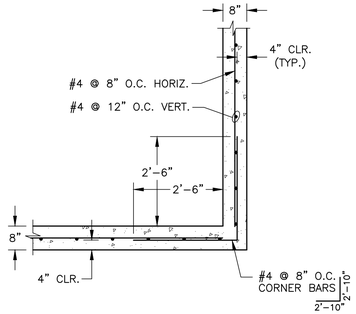
TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

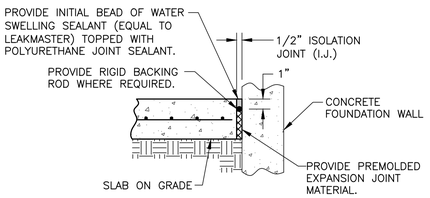
SOUTH SIDE PUMP STATION STRUCTURAL SECTION

SCALE: 1/2" = 1'-0" | PROJECT NO.: 2260

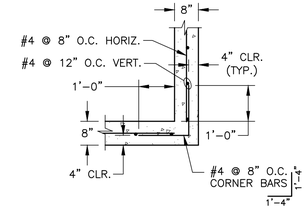
DATE: OCTOBER, 2022 | SHEET: S-6



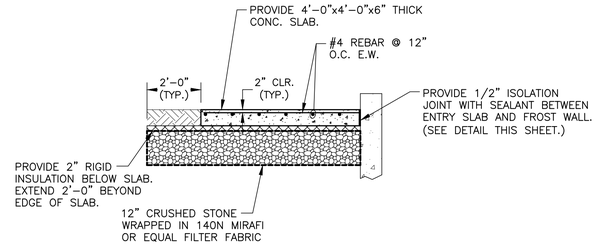
A S-2 PUMP STATION WALL CORNER REINFORCEMENT DETAIL



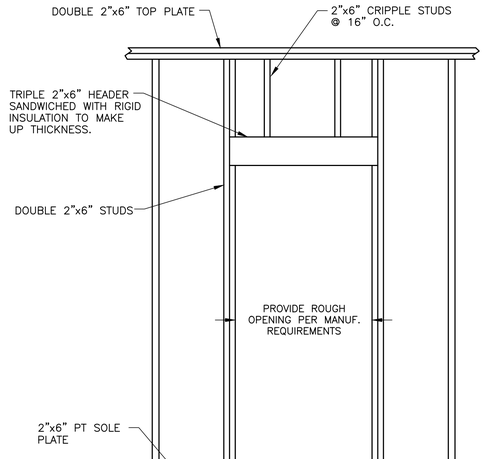
WATERTIGHT ISOLATION JOINT DETAIL



B S-2 WET WELL ACCESS HATCH CURB CORNER REINFORCEMENT DETAIL



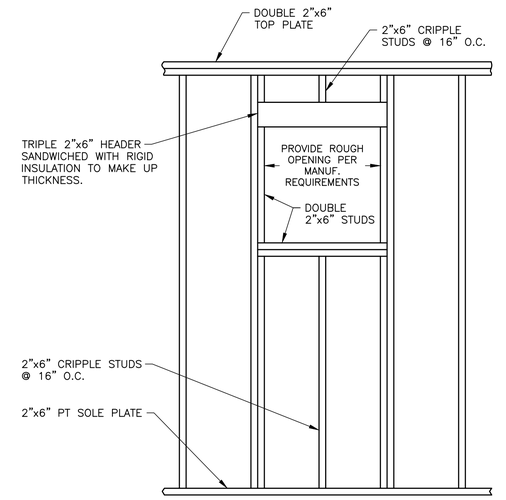
ENTRY DOOR SLAB DETAIL



NOTES:

1) PROVIDE ROUGH OPENING AS REQUIRED BY DOOR MANUFACTURER.
2) PROVIDE ALUM. CLAD 1"X3" PINE TRIM AROUND EXTERIOR OPENINGS.
3) CAULK ALL JOINTS WITH SILICONE.
4) PROVIDE ALUMINUM Z FLASHING OVER EXTERIOR DOORS.
5) CAULK BELOW DOOR SILL AND THRESHOLD.

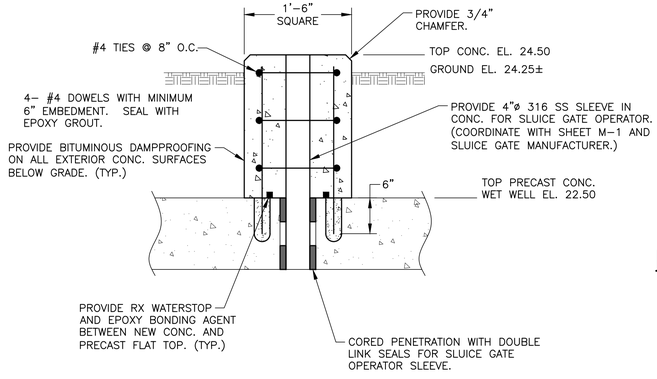
WOOD WALL DOOR FRAMING DETAIL



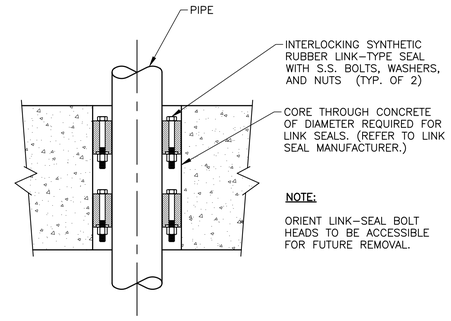
NOTES:

1) USE FRAMING DETAIL FOR ALL HVAC PROTRUSIONS.
2) USE Z-FLASHING OVER HVAC PROTRUSIONS.

WOOD WALL HVAC FRAMING DETAIL



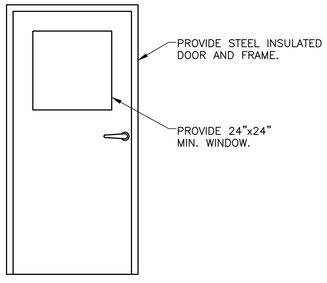
SLUICE GATE OPERATOR CONC. PEDESTAL DETAIL



NOTE:

ORIENT LINK-SEAL BOLT HEADS TO BE ACCESSIBLE FOR FUTURE REMOVAL.

PIPE PENETRATION DETAIL

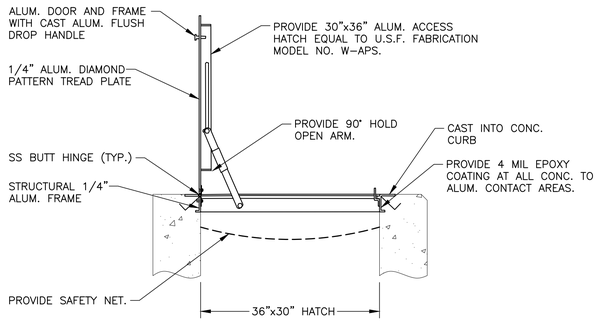


MARKER	OPENING ORIENTATION	NOMINAL SIZE	GLAZING	SWING	REMARKS
1	LH	6'-8"hx3'-0"w	24"x24"	OUT	EXTERIOR

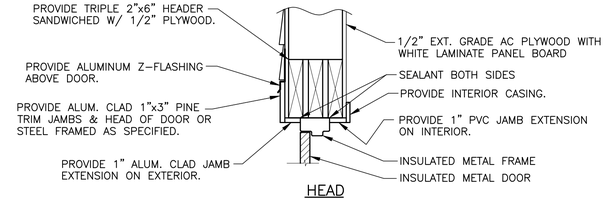
NOTES:

1) FIELD VERIFY ALL DOOR MEASUREMENTS AND ORIENTATIONS PRIOR TO ORDERING.
2) ALL DOORS SHALL BE INSULATED 1 3/4" THICK, GALV. STEEL CONSTRUCTION WITH PAINTED FINISH.
3) OPENING ORIENTATION IS BASED ON HINGE SIDE VIEWED FROM OUTSIDE.
4) SEE DETAIL THIS SHEET FOR DOOR FRAMING REQUIREMENTS.
5) ALL EXTERIOR DOORS SHALL HAVE TOP AND BOTTOM CAPS.

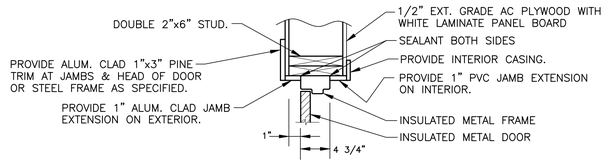
DOOR INSTALLATION SCHEDULE



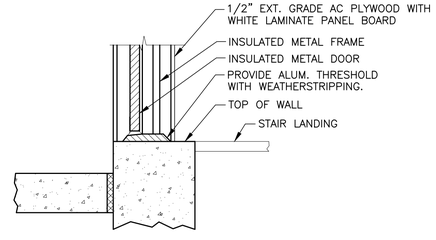
WET WELL HATCH DETAIL



HEAD



JAMB



SILL

WOOD WALL EXTERIOR DOOR SECTION

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

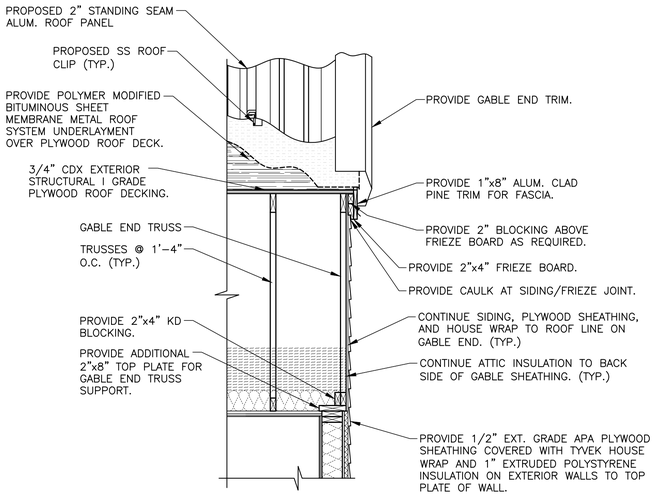
DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

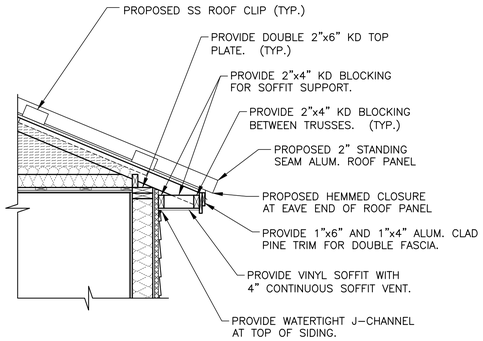
SOUTH SIDE PUMP STATION INSTALLATION

STRUCTURAL DETAILS

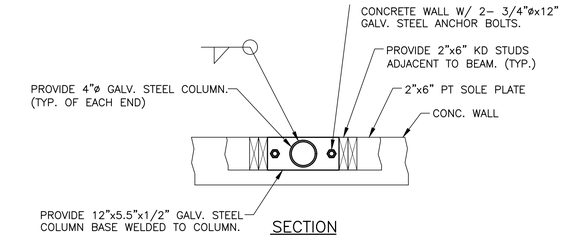
SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: S-7

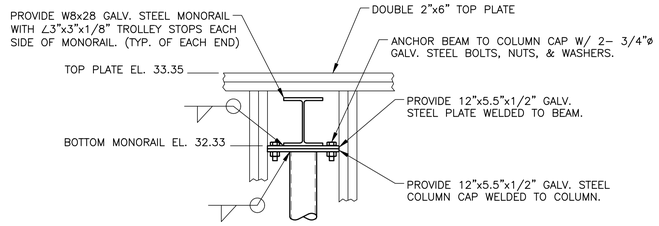


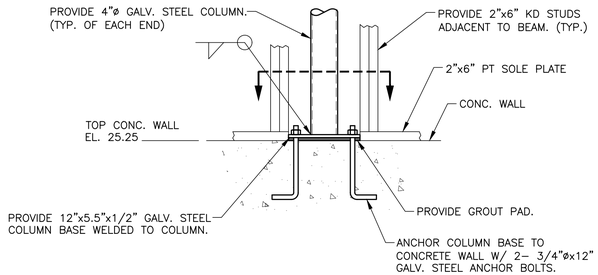
WOOD FRAME BUILDING GABLE END DETAIL



WOOD FRAME BUILDING EAVE END DETAIL

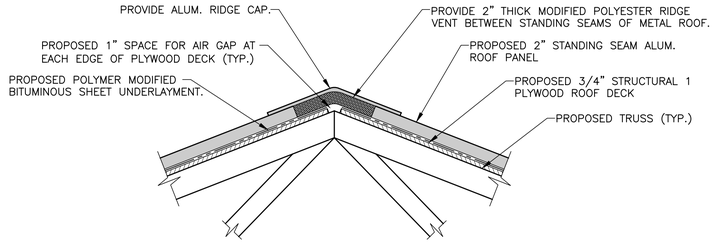




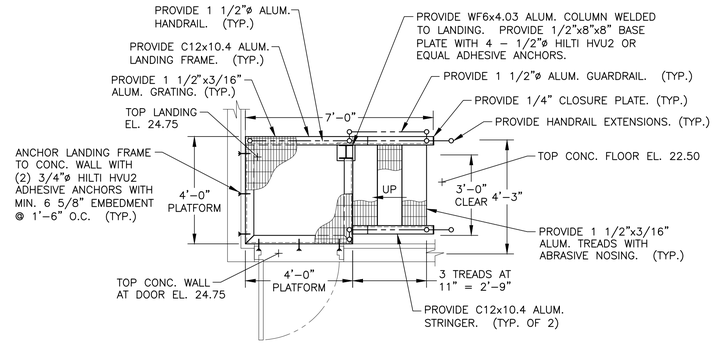


MONORAIL BEAM AND COLUMN DETAIL

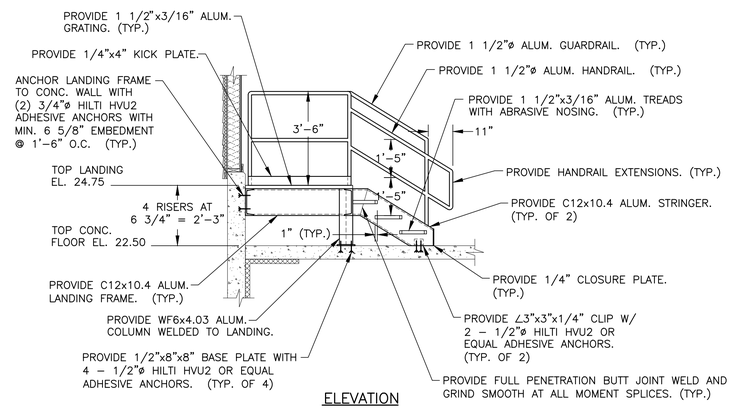
(TYP. OF 2)



RIDGE DETAIL

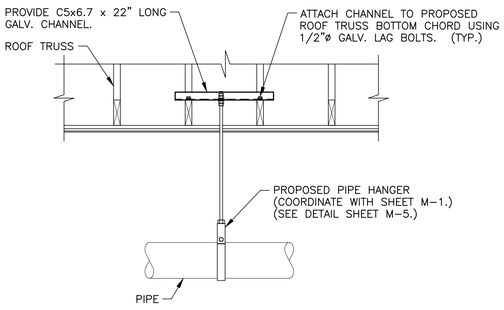


PLAN

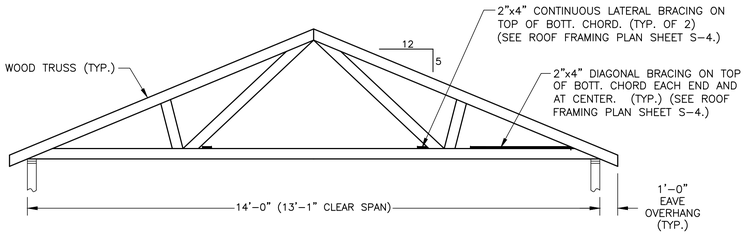


ELEVATION

PUMP STATION STAIR DETAIL



CEILING PIPE SUPPORT DETAIL



TRUSS DESIGN LOADS

1) GENERAL INFO: OCCUPANCY CATEGORY III; GROUND SNOW LOAD = 60 PSF
2) TOP CHORD: SNOW LOAD = 50 PSF; DEAD LOAD = 10 PSF
3) BOTTOM CHORD: (SEE NOTE NO. 5)
4) WIND LOADS: 100 MPH; IMPORTANCE FACTOR - 1.15; EXPOSURE CATEGORY B
5) SEISMIC LOADS: SOILS SITE CLASS B; R_s = 6 1/2; S_s = 0.20; S_1 = 0.06; $F_a - S_s$ = 0.80; $F_v - S_1$ = 0.94
6) MAIN STORY BEARING WALL WEIGHT = 2,000 LBS; ROOF WEIGHT = 4,000 LBS

NOTES:

1) TRUSS SPACING SHALL BE 1'-4" O.C. UNLESS OTHERWISE NOTED.
2) BRACE EACH TRUSS AS REQUIRED BY MANUFACTURER.
3) SEE ROOF FRAMING PLAN FOR BRACING LOCATIONS.
4) PROVIDE TEMPORARY BRACING FOR TRUSSES AS REQUIRED DURING CONSTRUCTION.
5) BOTTOM CHORD LOAD FOR NON-PIPE SUPPORTING TRUSSES SHALL BE 10 PSF. PROVIDE BOTTOM CHORD DESIGN AS REQUIRED FOR ADDITIONAL PIPE SUPPORTING LOADS FOR TRUSSES SUPPORTING PIPING AS SHOWN ON DRAWINGS.

PUMP STATION BUILDING TRUSS DETAIL

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

STRUCTURAL DETAILS

SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: S-8

STATE OF MAINE — ANNALEIS HAFFORD — No. 11562 — LICENSED PROFESSIONAL ENGINEER

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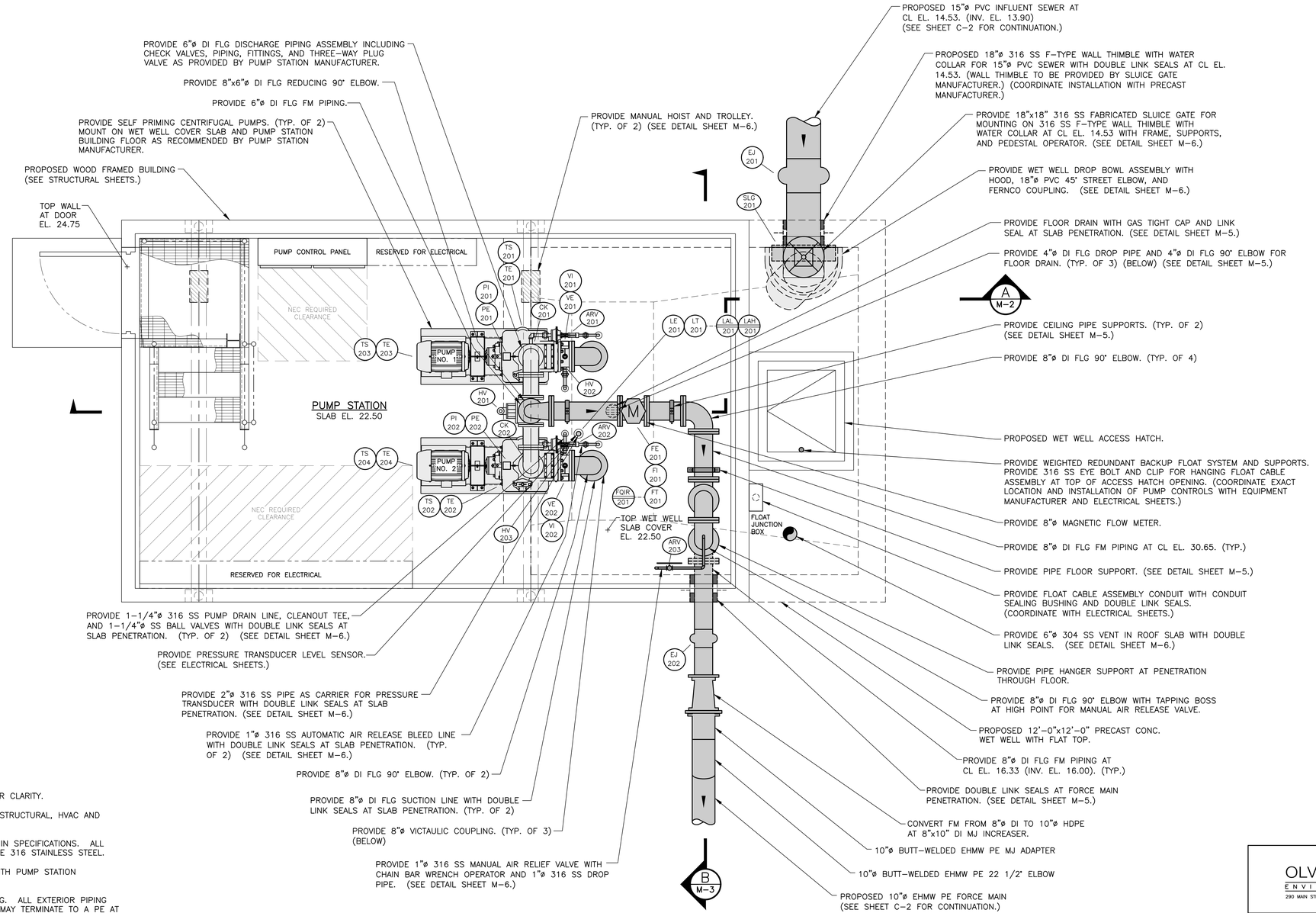


NOTES:

1) SOME ELEMENTS ARE SHOWN OUT OF PHASE FOR CLARITY.

2) COORDINATE ALL MECHANICAL WORK WITH CIVIL, STRUCTURAL, HVAC AND ELECTRICAL SHEETS.

3) SUPPORT ALL PIPING AND CONDUIT AS DEFINED IN SPECIFICATIONS. ALL HARDWARE AND SUPPORTS INSIDE WET WELL SHALL BE 316 STAINLESS STEEL.

4) VERIFY FINAL PUMP MOUNTING REQUIREMENTS WITH PUMP STATION MANUFACTURER.

5) ALL DI PIPING INSIDE STRUCTURES SHALL BE FLG. ALL EXTERIOR PIPING SHALL BE MJ. THE FLG PIPING INSIDE STRUCTURES MAY TERMINATE TO A PE AT EJ CONNECTIONS.

6) LOCATE FLOAT LEVEL CONTROL WIRING ADJACENT TO ACCESS HATCH FOR EASE OF RETRIEVAL.

7) ALL PIPING PENETRATIONS THROUGH WET WELL SHALL BE CORED AND DOUBLE LINK SEALED FOR GAS-TIGHT CONNECTION. (SEE DETAIL SHEET M-5.)

8) PAINT ALL PIPING AND EQUIPMENT ACCORDING TO SPECIFICATIONS.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

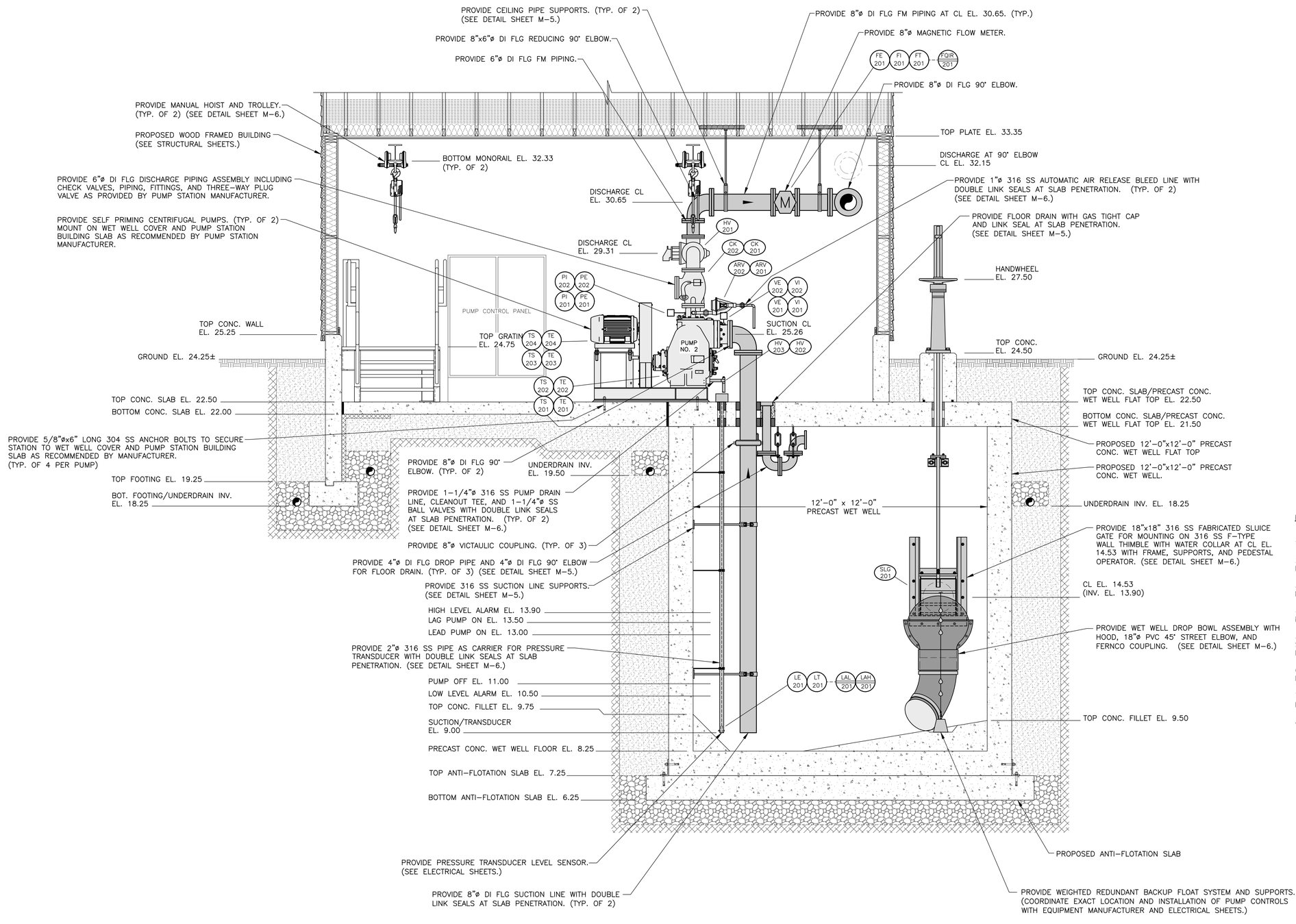
DES.BY: EWH	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION MECHANICAL PLAN

SCALE: 1/2" = 1'-0"	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: M-1



A M-1 PUMP STATION MECHANICAL SECTION

NOTES:

1) SOME ELEMENTS ARE SHOWN OUT OF PHASE FOR CLARITY.

2) COORDINATE ALL MECHANICAL WORK WITH CIVIL, STRUCTURAL, HVAC AND ELECTRICAL SHEETS.

3) SUPPORT ALL PIPING AND CONDUIT AS DEFINED IN SPECIFICATIONS. ALL HARDWARE AND SUPPORTS INSIDE WET WELL SHALL BE 316 STAINLESS STEEL.

4) VERIFY FINAL PUMP MOUNTING REQUIREMENTS WITH PUMP STATION MANUFACTURER.

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6) LOCATE FLOAT LEVEL CONTROL WIRING ADJACENT TO ACCESS HATCH FOR EASE OF RETRIEVAL.

7) ALL PIPING PENETRATIONS THROUGH WET WELL SHALL BE CORED AND DOUBLE LINK SEALED FOR GAS-TIGHT CONNECTION. (SEE DETAIL SHEET M-5.)

8) PAINT ALL PIPING AND EQUIPMENT ACCORDING TO SPECIFICATIONS.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

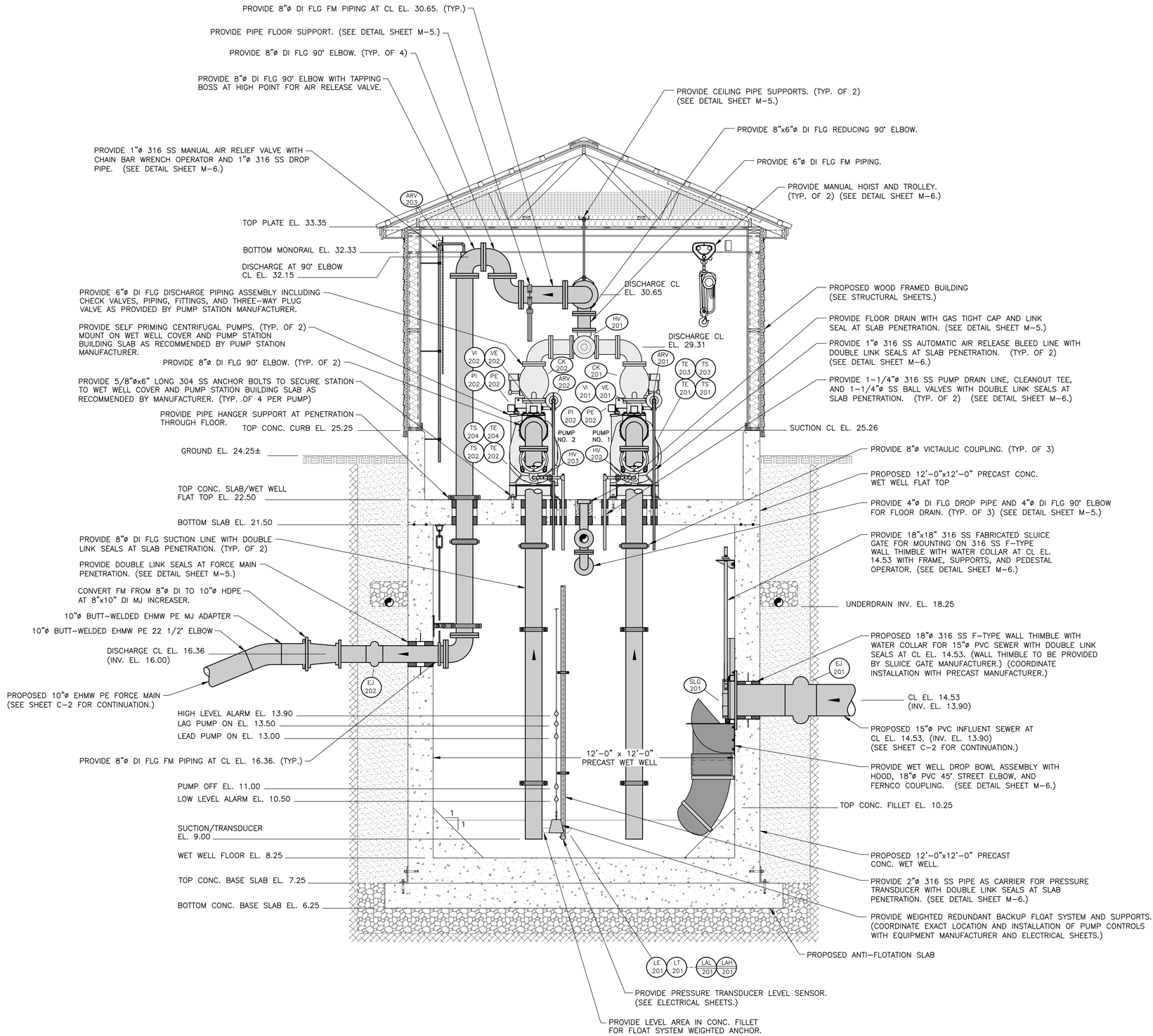
DES.BY: EWH	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SOUTH SIDE PUMP STATION MECHANICAL SECTION

SCALE: 1/2" = 1'-0"	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: M-2



B M-1 PUMP STATION MECHANICAL SECTION

NOTES:

1) SOME ELEMENTS ARE SHOWN OUT OF PHASE FOR CLARITY.

2) COORDINATE ALL MECHANICAL WORK WITH CIVIL, STRUCTURAL, HVAC AND ELECTRICAL SHEETS.

3) SUPPORT ALL PIPING AND CONDUIT AS DEFINED IN SPECIFICATIONS. ALL HARDWARE AND SUPPORTS INSIDE WET WELL SHALL BE 316 STAINLESS STEEL.

4) VERIFY FINAL PUMP MOUNTING REQUIREMENTS WITH PUMP STATION MANUFACTURER.

5) ALL DI PIPING INSIDE STRUCTURES SHALL BE FLG. ALL EXTERIOR PIPING SHALL BE MJ. THE FLG PIPING INSIDE STRUCTURES MAY TERMINATE TO A PE AT EJ CONNECTIONS.

6) LOCATE FLOAT LEVEL CONTROL WIRING ADJACENT TO ACCESS HATCH FOR EASE OF RETRIEVAL.

7) ALL PIPING PENETRATIONS THROUGH WET WELL SHALL BE CORED AND DOUBLE LINK SEALED FOR GAS-TIGHT CONNECTION. (SEE DETAIL SHEET M-5.)

8) PAINT ALL PIPING AND EQUIPMENT ACCORDING TO SPECIFICATIONS.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

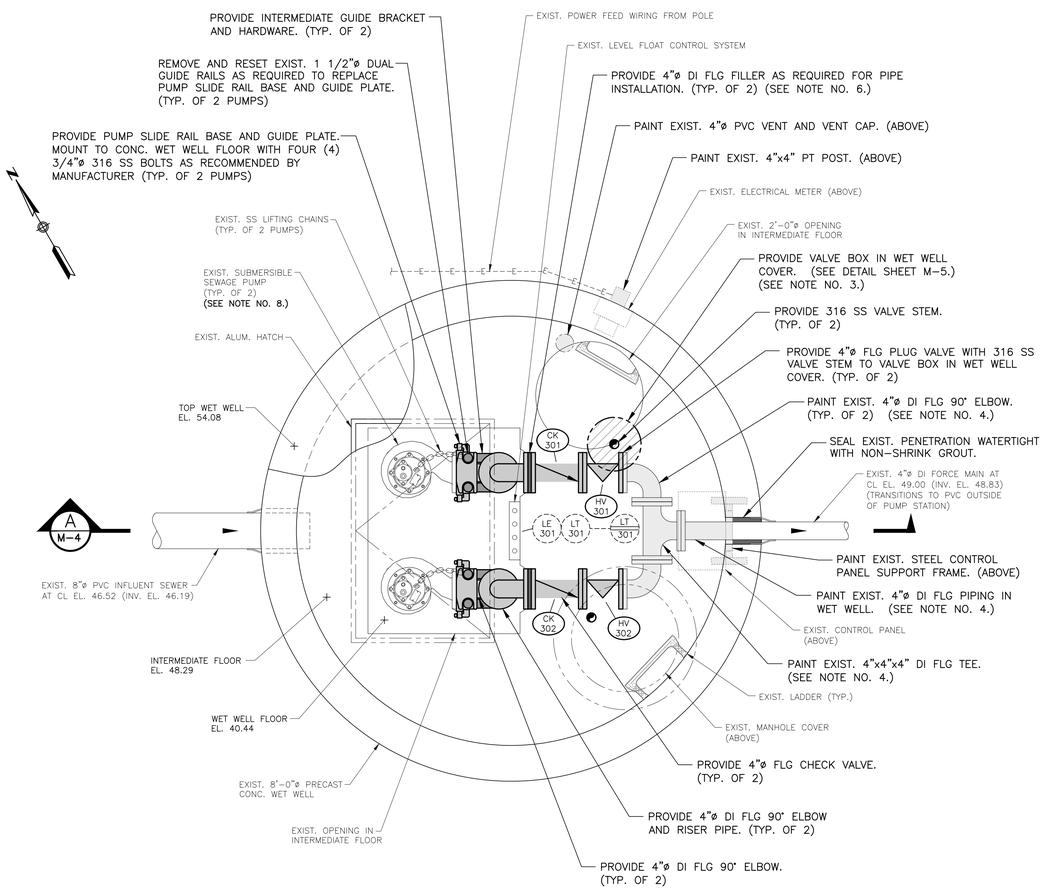
DES.BY: EWH	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

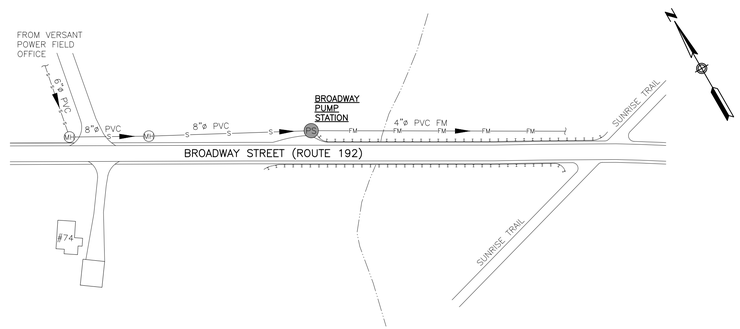
SOUTH SIDE PUMP STATION MECHANICAL SECTION

SCALE: 1/2" = 1'-0"	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: M-3



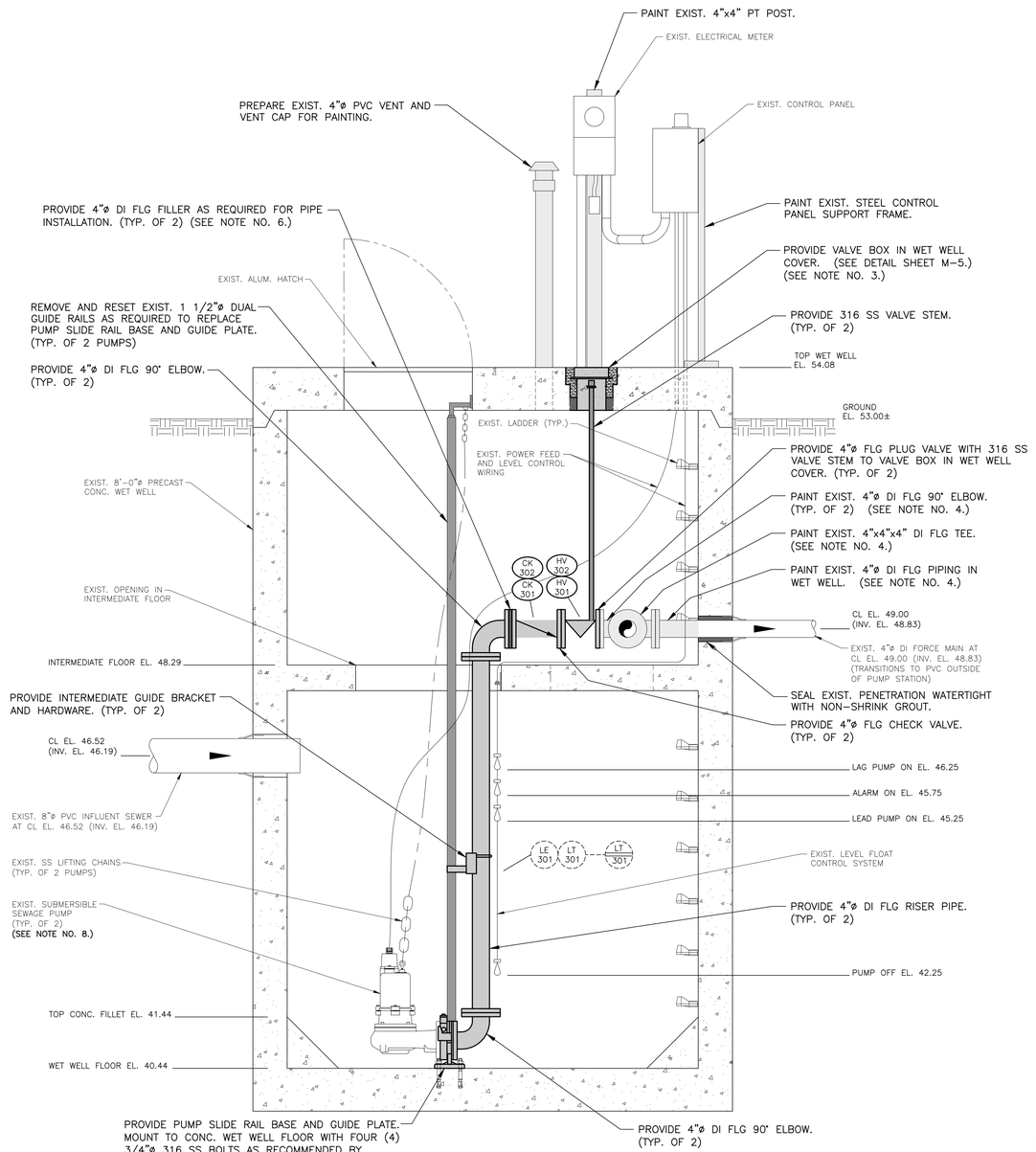
BROADWAY PUMP STATION MECHANICAL PLAN

SCALE: 3/4" = 1'-0"



BROADWAY PUMP STATION LOCATION PLAN

SCALE: 1" = 100'



A M-4 BROADWAY PUMP STATION MECHANICAL SECTION

SCALE: 3/4" = 1'-0"

NOTES:

1) INFORMATION ON THIS SHEET PROVIDED IN PART BY:

BANGOR HYDRO ELECTRIC CO. DIVISION SERVICE CENTER SANITARY SEWER SYSTEM BY CES, INC. DATED SEPTEMBER, 1996.

BANGOR HYDRO MACHIAS, MAINE BY AMERICAN CONCRETE IND. DATED MAY, 1997.

2) CONTRACTOR SHALL PROVIDE SEPTIC TRUCK BY-PASS PUMPING AS REQUIRED TO CONDUCT WORK. THE EXISTING PUMP CAPACITY IS 100 GPM @25 TDH AND THE AVERAGE PUMP RUN TIME DURING DRY WEATHER IS 0.70 HOURS/WEEK.

3) CONTRACTOR SHALL VERIFY LOCATION OF VALVE BOX IN FIELD FOLLOWING FINAL PIPE AND VALVE INSTALLATION.

4) PREPARE FOR PAINTING ALL EXISTING WET WELL PIPING DESIGNATED TO REMAIN ACCORDING TO SPECIFICATIONS AND PAINT ALL NEW AND EXISTING PIPING, VALVES, AND FITTINGS.

5) ALL HOLES CORES THROUGH EXISTING REINFORCED CONCRETE SHALL BE COATED WITH A 10 MIL LAYER OF SIKA FERROGARD 903 OR EQUAL GROUT TO PROTECT REBAR.

6) CONTRACTOR TO FIELD VERIFY EXISTING GATE VALVE AND CHECK VALVE FLANGE TO FLANGE DIMENSIONS AND PROVIDE NEW PLUG VALVE AND CHECK VALVES WITH SIMILAR FLANGE TO FLANGE DIMENSIONS. PROVIDE FLANGE FILLER IF REQUIRED TO MATCH EXISTING DIMENSIONS.

7) SOME ITEMS SHOWN OUT OF PHASE FOR CLARITY.

8) TEMPORARILY REMOVE AND RESET EXIST. PUMPS TO ACCOMMODATE NEW WORK.

ALL WORK SHOWN ON THIS DRAWING IS PART OF ALTERNATE BID NO. 1.

STATE OF MAINE * ANNALEIS HAFFORD * No. 11562 * LICENSED PROFESSIONAL ENGINEER *

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

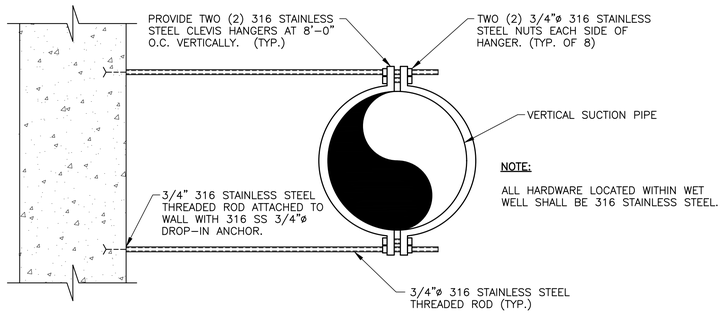
DES.BY:	NWD	DR.BY:	NWD	CK.BY:	AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

BROADWAY PUMP STATION MECHANICAL PLAN AND SECTION (ALTERNATE BID NO. 1)

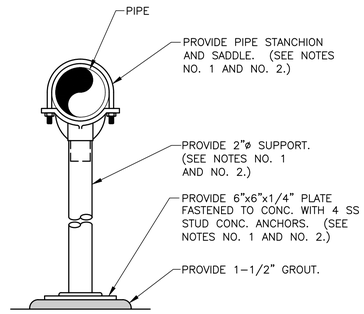
SCALE:	AS NOTED	PROJECT NO.:	2260
DATE:	OCTOBER, 2022	SHEET:	M-4



NOTE:

ALL HARDWARE LOCATED WITHIN WET WELL SHALL BE 316 STAINLESS STEEL.

SUCTION LINE SUPPORT DETAIL

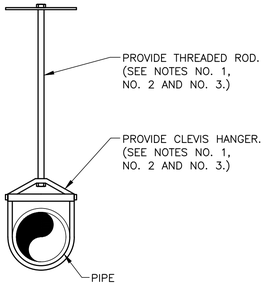


NOTES:

1) GALVANIZED STEEL OR 304 STAINLESS STEEL SHALL BE USED IN ALL WET OR DAMP, NON-CORROSIVE ENVIRONMENTS SUCH AS PUMP STATION BUILDING AREA.

2) DISSIMILAR METALS SHALL NOT COME IN CONTACT WITH EACH OTHER TO ELIMINATE THE POSSIBILITY OF GALVANIC CORROSION. IF DISSIMILAR METALS MUST MAKE CONTACT INSERT SPACER MATERIAL SUCH AS NEOPRENE, RUBBER OR CORROSION PROTECTION TAPE BETWEEN THE TWO METALS.

FORCE MAIN FLOOR PIPE SUPPORT DETAIL



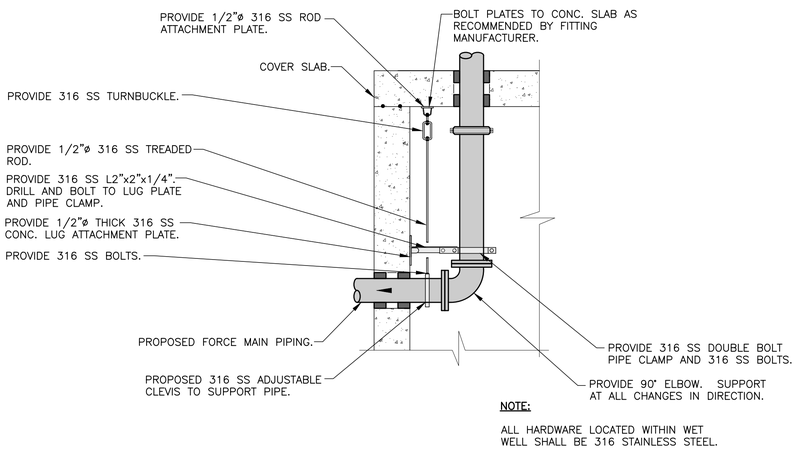
NOTES:

1) GALVANIZED STEEL OR 304 STAINLESS STEEL SHALL BE USED IN ALL WET OR DAMP, NON-CORROSIVE ENVIRONMENTS SUCH AS PUMP STATION BUILDING AREA.

2) 316 STAINLESS STEEL SHALL BE USED IN ALL CORROSIVE OR SUBMERGED ENVIRONMENTS INCLUDING WET WELL.

3) DISSIMILAR METALS SHALL NOT COME IN CONTACT WITH EACH OTHER TO ELIMINATE THE POSSIBILITY OF GALVANIC CORROSION. IF DISSIMILAR METALS MUST MAKE CONTACT INSERT SPACER MATERIAL SUCH AS NEOPRENE, RUBBER OR CORROSION PROTECTION TAPE BETWEEN THE TWO METALS.

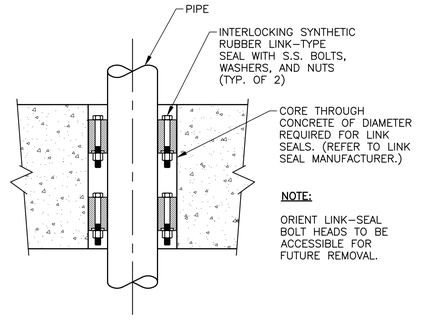
FORCE MAIN CEILING PIPE SUPPORT DETAIL



NOTE:

ALL HARDWARE LOCATED WITHIN WET WELL SHALL BE 316 STAINLESS STEEL.

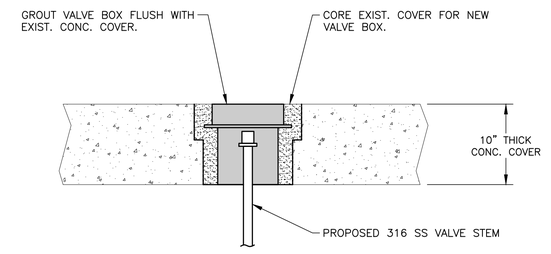
FORCE MAIN SUPPORT DETAIL



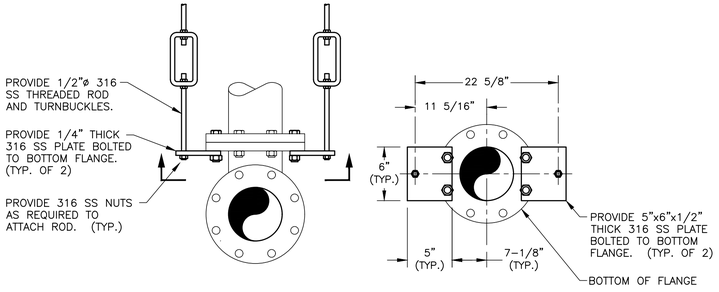
NOTE:

ORIENT LINK-SEAL BOLT HEADS TO BE ACCESSIBLE FOR FUTURE REMOVAL.

PIPE PENETRATION DETAIL



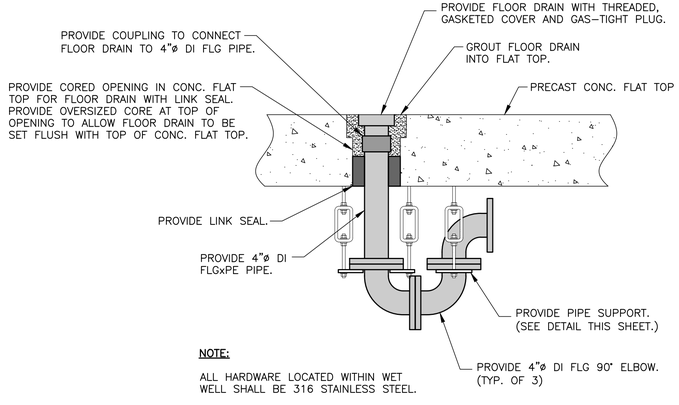
VALVE BOX INSTALLATION DETAIL



NOTE:

ALL HARDWARE LOCATED WITHIN WET WELL SHALL BE 316 STAINLESS STEEL.

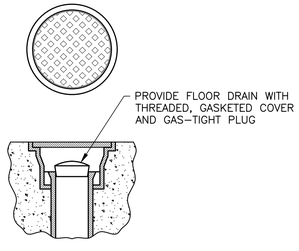
FLOOR DRAIN PIPE SUPPORT DETAIL



NOTE:

ALL HARDWARE LOCATED WITHIN WET WELL SHALL BE 316 STAINLESS STEEL.

FLOOR DRAIN DETAIL



GAS-TIGHT FLOOR DRAIN DETAIL

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

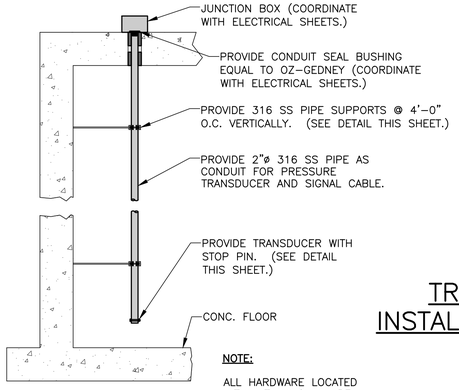
DES.BY: NWD	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

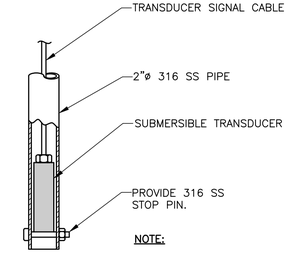
SOUTH SIDE PUMP STATION INSTALLATION

MECHANICAL DETAILS

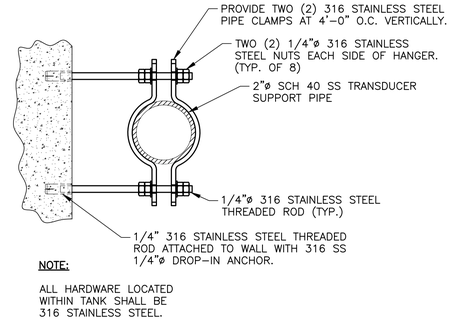
SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: M-5



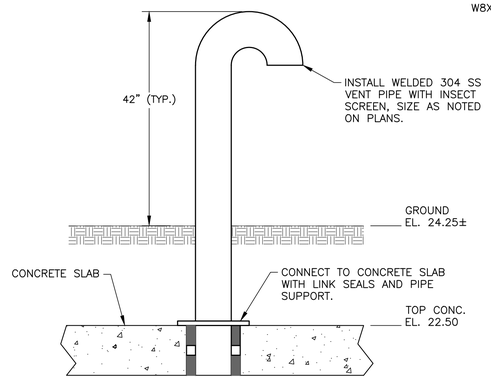
TRANSDUCER RISER SUPPORT DETAIL



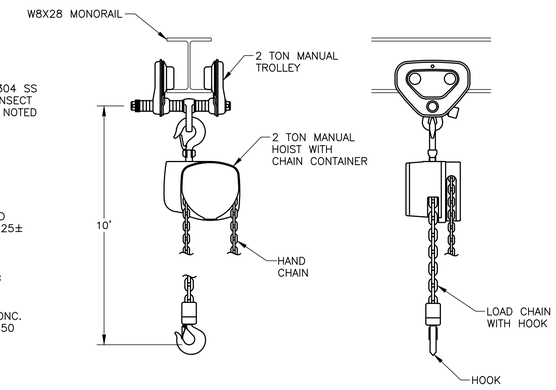
TRANSDUCER INSTALLATION DETAIL



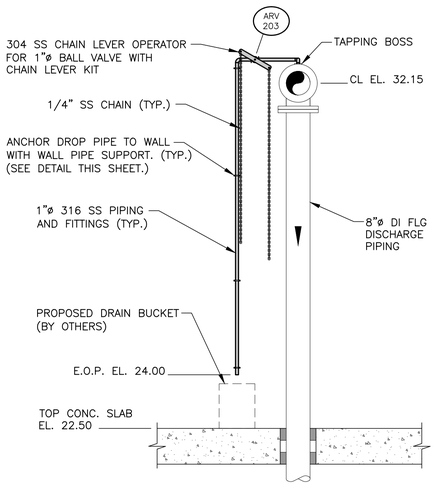
TRANSDUCER PIPE SUPPORT DETAIL



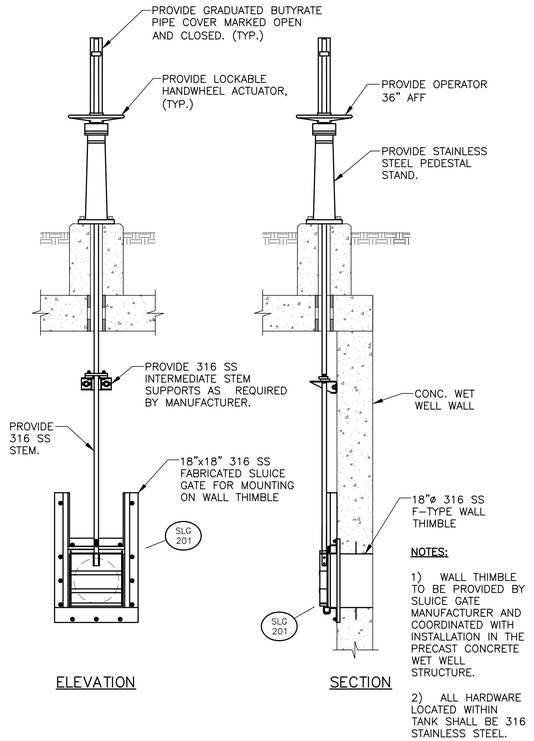
VENT DETAIL



MANUAL HOIST AND TROLLEY DETAIL

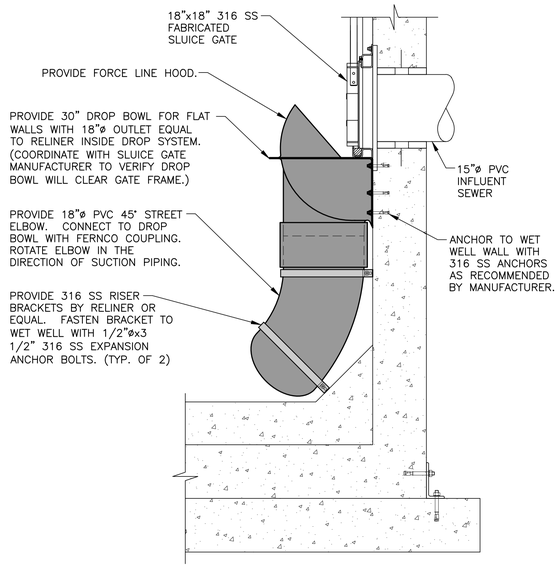


MANUAL AIR RELIEF VALVE DETAIL

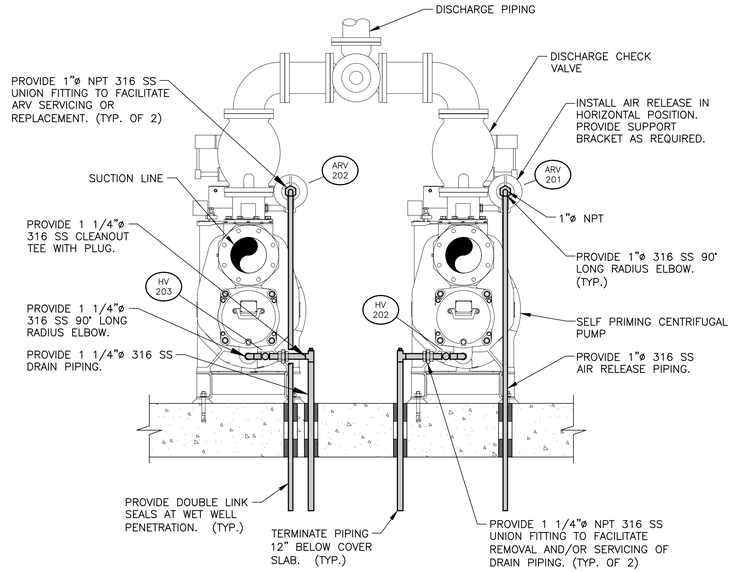


ELEVATION SECTION

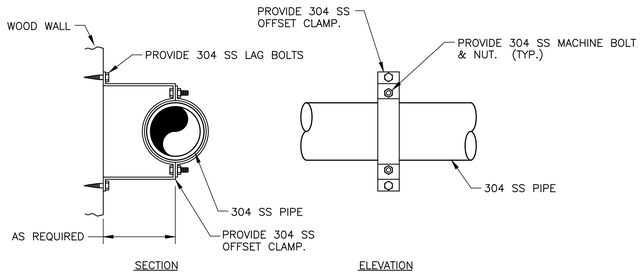
INFLUENT SLUICE GATE DETAIL



WET WELL DROP BOWL DETAIL



PUMP STATION AUTOMATIC AIR RELEASE BLEED & PUMP DRAIN LINE INSTALLATION DETAIL



AIR RELIEF PIPE SUPPORT DETAIL

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: NWD/EWH	DR.BY: JAH/NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

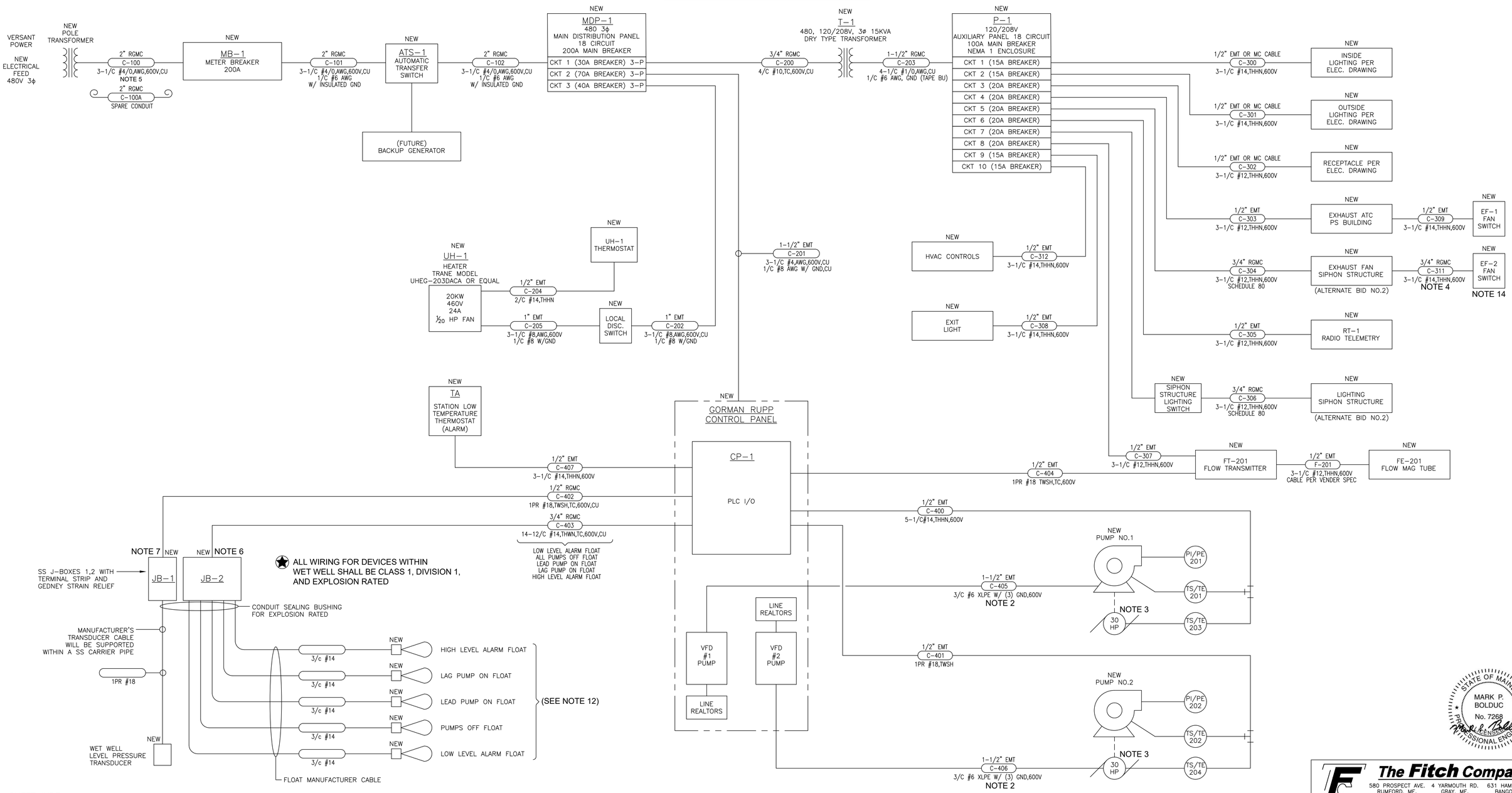
SOUTH SIDE PUMP STATION INSTALLATION

MECHANICAL DETAILS

SCALE: NONE	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: M-6

STATE OF MAINE — ANNALEIS HAFFORD — No. 11562 — LICENSED PROFESSIONAL ENGINEER

TREATMENT BUILDING



SHEET INDEX:

NOTES:

1. 1-1/2" SEAL-TITE TO MOTOR. USE UNISTRUT SUPPORTS ON VERTICAL RISERS.
2. VFD RATED CABLE XLPE SHIELDED OR EQUIVALENT.
3. INTERNAL TEMPERATURE DEVICE TO MOTOR.
4. FAN SPEED CONTROL 3/C #14 THHN COUNT AS REQUIRED.
5. USE RGMC FOR SERVICE ENTRANCE CABLES.
6. FLOAT SWITCHES (JUNCTION BOX) LOCATED ADJACENT TO THE HATCH SEE DWG. 2260 SHT. M-1
7. LEVEL PRESSURE TRANSDUCER JUNCTION BOX LOCATED BETWEEN PUMPS. SEE DWG. 2260 SHT. M-1
8. ELECTRICAL SERVICE IS SIZED BASED ON ONE PUMP RUNNING AT A TIME WITH FULL REDUNDANCY OFF 2ND PUMP. ELECTRICAL CALCULATIONS NOT INTENDED TO SUPPORT BOTH PUMPS RUNNING SIMULTANEOUSLY.
9. USE THHN #12, 600V STANDARD COOPER WIRE.
10. 1-BK, 1-WH, 1-GN (FOR ALL 120V FEEDS TO LIGHTS/RECEPT./FANS/RADIO TELEMETRY.
11. PUMP STATION BUILDING IS UNCLASSIFIED.
12. COORDINATE AND SUPPORT FLOAT CABLES NEAR ACCESS HATCH FOR REMOVAL & REPLACEMENT. SEE CONTROL PANEL SUBMITTALS FOR CONNECTIONS OF FLOAT SWITCHES AND TRANSDUCER EQUIPMENT, ETC.
13. VFD'S AND INPUT LINE REALTORS ARE PROVIDED BY THE PUMP STATION MANUFACTURER AND WITH THE CONTROL PANEL. PANEL MOUNTED OR SEPARATE WALL MOUNTED CONFIGURATION OF THE VFD'S AND LINE REALTORS SHALL WILL BE COORDINATED WITH THE SUBMITTED EQUIPMENT.
14. USE RATED SWITCH – CLASS 1, DIV. 1.

STATE OF MAINE MARK P. BOLDUC No. 7268 REGISTERED PROFESSIONAL ENGINEER

The Fitch Company
580 PROSPECT AVE. RUMFORD, ME. (207) 364-7441
4 YARMOUTH RD. GRAY, ME. (207) 657-5226
631 HAMMOND ST. BANGOR, ME. (207) 947-3932

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
DATE	ADDITION OR REVISION

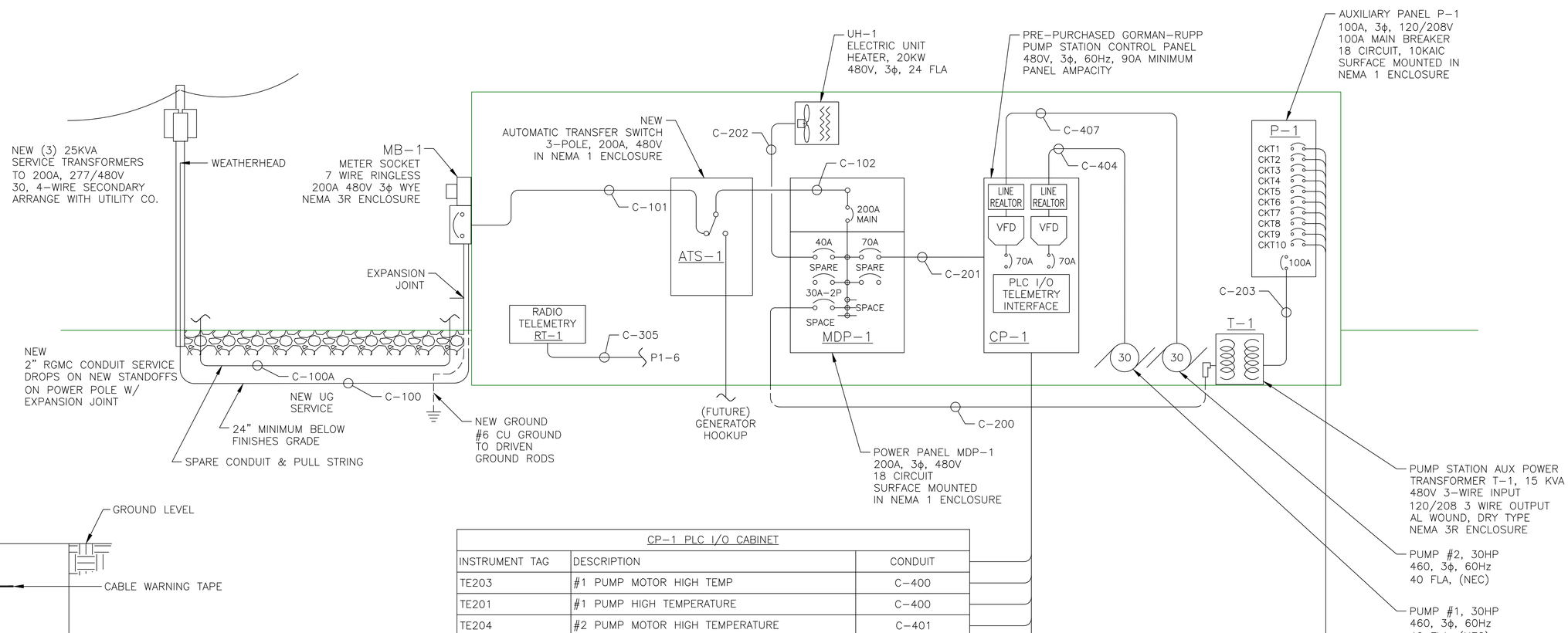
DES.BY:	BJS	DR.BY:	HEM	CK.BY:	EWH

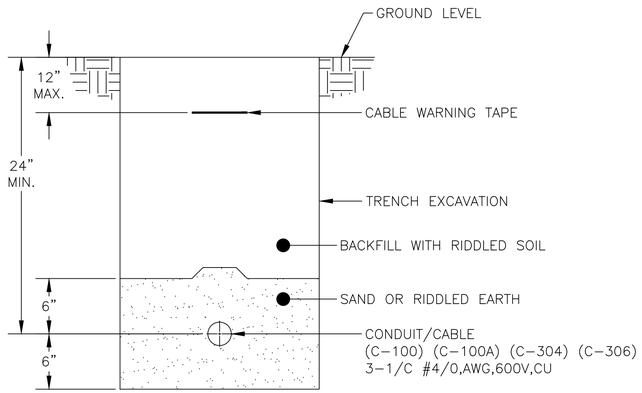
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

TREATMENT BUILDING CONDUIT BLOCK DIAGRAM

SCALE: NTS	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E001





CABLE LAYING DETAIL DIRECT BURIED CABLES

CP-1 PLC I/O CABINET		
INSTRUMENT TAG	DESCRIPTION	CONDUIT
TE203	#1 PUMP MOTOR HIGH TEMP	C-400
TE201	#1 PUMP HIGH TEMPERATURE	C-400
TE204	#2 PUMP MOTOR HIGH TEMPERATURE	C-401
TE202	#2 PUMP HIGH TEMPERATURE	C-401
FT201	#1 OR #2 PUMP FLOW RATE	C-404
FS1,2,3,4,5	BACKUP LEVEL FLOAT SWITCHES	C-403
LE201	WET WELL LEVEL PRESSURE TRANSDUCER	C-402
AL-1	ALARM LIGHT (RIVER SIDE)	C-407

P-1 120/208V AUXILIARY PANEL - 18 CIRCUIT		
CKT. DESIGNATIONS	DESCRIPTION	CONDUIT
P1-1	NEW PS INSIDE LIGHTING	C-300
P1-2	NEW PS OUTSIDE LIGHTING	C-301
P1-3	NEW PS RECEPTACLES	C-302
P1-4	NEW PS EXHAUST FAN	C-303
P1-5	SIPHON EXHAUST FAN (ALTERNATE BID NO.2)	C-304
P1-6	RADIO TELEMETRY	C-305
P1-7	SIPHON LIGHTING (ALTERNATE BID NO.2)	C-306
P1-8	FE201 FLOW TUBE	C-307
P1-9	EXIT LIGHTING	C-308
P1-10	HVAC CONTROLS	C-312

PUMP STATION POWER RISER DIAGRAM

STATE OF MAINE
MARK P. BOLDUC
No. 7268
REGISTERED PROFESSIONAL ENGINEER

The Fitch Company
580 PROSPECT AVE. RUMFORD, ME. (207) 364-7441
4 YARMOUTH RD. GRAY, ME. (207) 657-5226
631 HAMMOND ST. BANGOR, ME. (207) 947-3932

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
DATE	ADDITION OR REVISION

DES.BY: BJS	DR.BY: HEM	CK.BY: EWH

TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION POWER RISER DIAGRAM

SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E002

PUMP STATION POWER DISTRIBUTION PLAN

YAGI, DIRECTIONAL GAIN, ANTENNA ON WALL MOUNTED MAST

10' X 3/4" GRS CONDUIT MAST. ADJUST HEIGHT AS REQUIRED TO ACHIEVE NEEDED FADE MARGIN

SECURELY ATTACH MAST HARDWIRED TO BUILDING. ATTACH MAST BOTTOM WITH 3 LEGGED MOUNT. USE 48" VERTICAL SPACING OF VERTICAL ATTACHMENT POINTS.

INSTALL WITH DRIP LOOP

C-407

STATION LOW TEMPERATURE THERMOSTAT (ALARM)

TA

CP-1
PUMP CONTROL PANEL

RT-1
RADIO TELEMETRY

FLOW XMTR

C-201 — 3ϕ POWER CKT.2

C-401

C-400

C-305 — CKT. P1-6

C-307 — CKT. P1-8

TS 203 / TE 203 — PUMP NO. 1

TS 201 / TE 201

TS 202 / TE 202

TS 204 / TE 204 — PUMP NO. 2

M

PUMP STATION
SLAB EL. 22.50
(3,100 CF)

AUTOMATIC TRANSFER SWITCH

MAIN DISTRIB. PANEL 200A, 3ϕ, 480V 18 CIRCUIT

480V INPUT 120/208V 15KVA DRY TYPE TRANSFORMER

AUXILIARY PANEL P-1 100A, 3ϕ, 120/208V 100A MAIN BREAKER 18 CIRCUIT

3/4" A-C PLYWOOD BACKBOARD WITH COAT PRIMER & 1 FINISH COAT OF GRAY ENAMEL PAINT. APPLY PAINT BEFORE INSTALLING PANELS & EQUIPMENT

(FUTURE) GENERATOR

ATS-1 | MDP-1 | T-1 | P-1

MB-1
METER CIRCUIT BREAKER
200A

2" RGMC
C-100
3-1/C #4/0 AWG, 600V

NEW GROUND #6 CU GROUND TO DRIVEN GROUND RODS

NEW VERSANT POWER ELECTRICAL FEED 480V 3ϕ

BURIED A MINIMUM OF 18" UNDERGROUND

18"

SCHEDULE 80 3/4" RGMC
C-304
3-1/C #12 THHN, 600V

120V TO SIPHON STRUCTURE EXHAUST FAN CIRCUIT P1-5 (ALTERNATE BID NO.2) SEE DWG. 22045E005

BURIED A MINIMUM OF 18" UNDERGROUND (ALTERNATE BID NO.2)

STATE OF MAINE
MARK P. BOLDUC
No. 7268
REGISTERED PROFESSIONAL ENGINEER

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631 HAMMOND ST. BANGOR, ME. (207) 947-3932

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
DATE	ADDITION OR REVISION

DES.BY: BJS	DR.BY: HEM	CK.BY: EWH

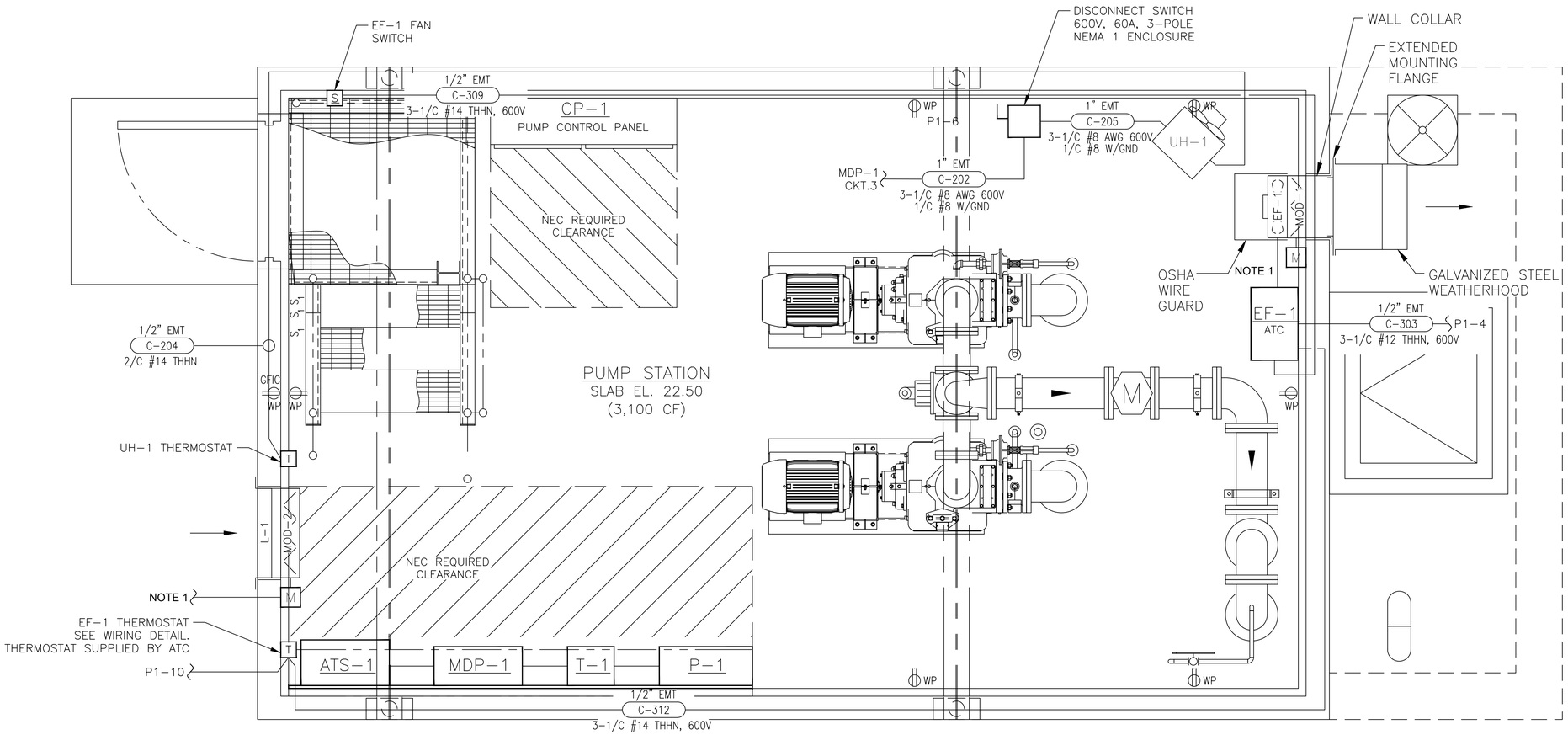
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION POWER DISTRIBUTION PLAN

SCALE: 3/4"=1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E003

HEATING/VENTILATION
POWER & CONTROL PLAN



NOTES:

1. HVAC CONTROLS TO BE WIRED BY HVAC CONTRACTOR. 120VAC 15AMP CIRCUIT FROM P1-10.

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ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
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DES.BY: BJS	DR.BY: HEM	CK.BY: EWH

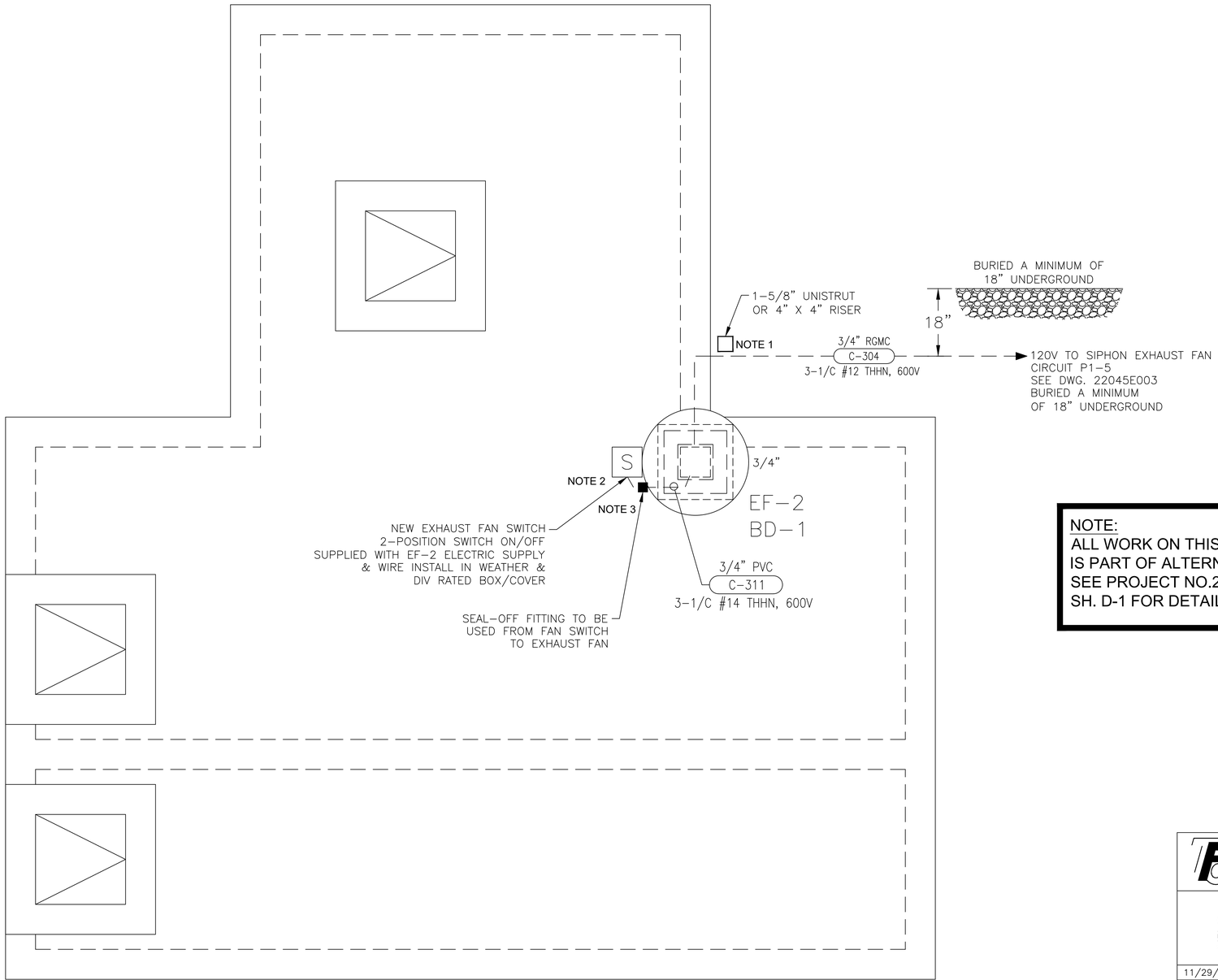
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

HEATING/VENTILATION
POWER & CONTROL PLAN

SCALE: 3/4"=1'-0	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E004

SIPHON STRUCTURE VENTILATION, POWER & CONTROL PLAN (ALTERNATE BID NO.2)



NOTE:
ALL WORK ON THIS DRAWING IS PART OF ALTERNATE BID NO.2.
SEE PROJECT NO.2264 SH. D-1 FOR DETAILS.

NOTES:

1. USE 1-5/8" UNISTRUT OR 4" X 4" VERTICAL RISE FOR EXHAUST FAN SWITCH IF UNABLE TO MOUNT THE SWITCH TO THE FAN HOUSING STRUCTURE
2. FAN SWITCH 2-POSITION ON/OFF FAN SWITCH BOX WITH WEATHER PROOF COVER
3. SEAL-OFF FITTING TO BE USED FROM FAN SWITCH BOX TO EXHAUST FAN

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OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
DATE	ADDITION OR REVISION

DES.BY: BJS	DR.BY: HEM	CK.BY: EWH

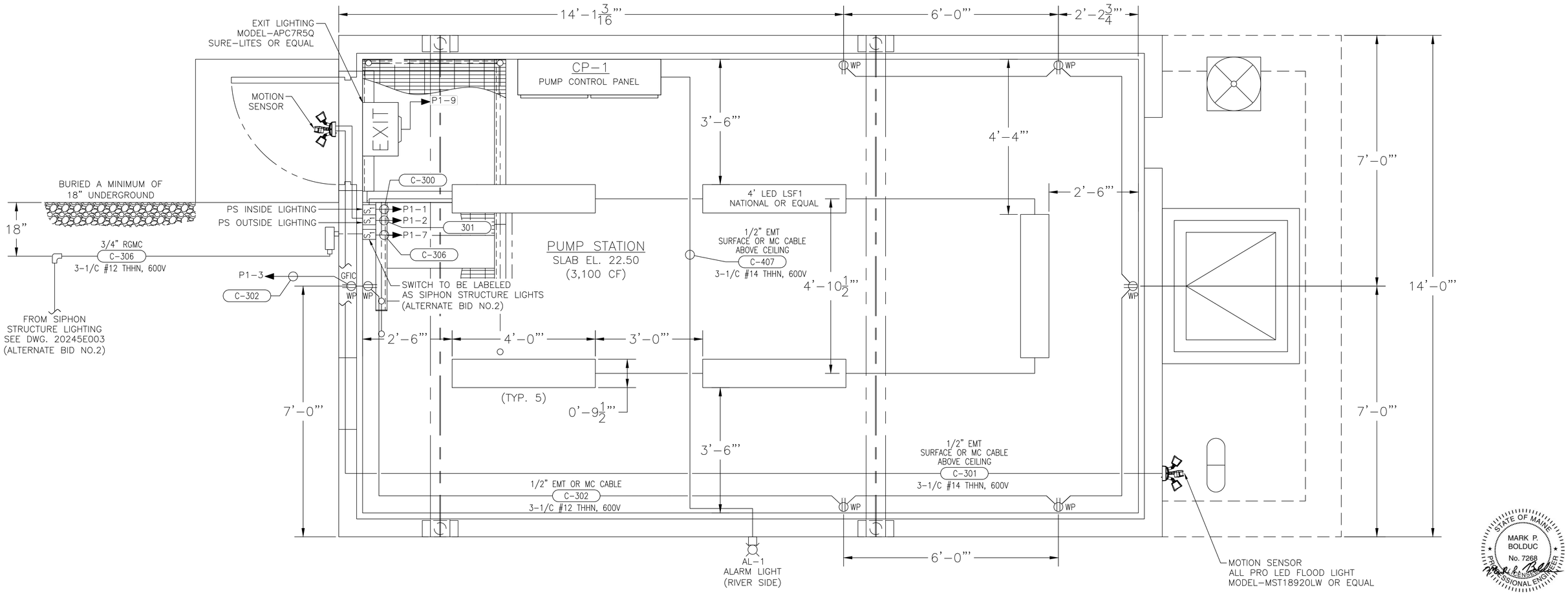
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

SIPHON STRUCTURE VENTILATION, POWER & CONTROL PLAN

SCALE: 3/4"-1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E005

PUMP STATION LIGHTING PLAN



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ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION
11/29/22	FOR BID

DES.BY:	DR.BY:	CK.BY:
BJS	HEM	EWH

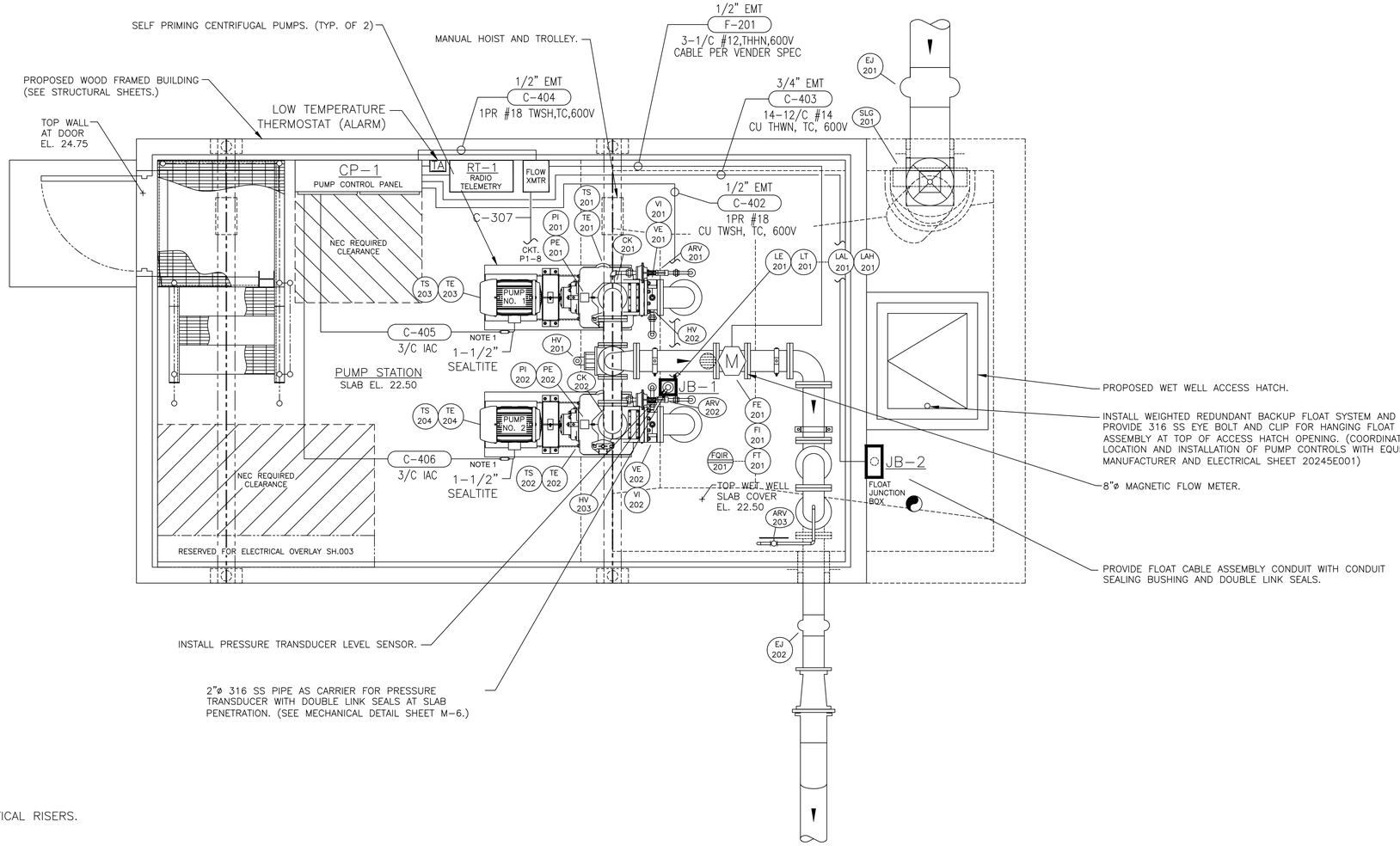
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION
LIGHTING PLAN

SCALE: 3/4"=1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E006

PUMP STATION EQUIPMENT POWER, CONTROL AND INSTRUMENTATION PLAN



NOTES:

1. 1-1/2" SEAL-TITE TO MOTOR. USE UNISTRUT SUPPORTS ON VERTICAL RISERS.
2. VFD RATED CABLE XLPE OR EQUIVALENT.
3. INTERNAL TEMPERATURE DEVICE TO MOTOR.
4. FAN SPEED CONTROL 3/C #14 THHN COUNT AS REQUIRED.
5. ABOVE GROUND USE RGMC. UNDERGROUND USE SCHEDULE 80 PVC.
6. FLOAT SWITCHES (JUNCTION BOX) LOCATED ADJACENT TO THE HATCH SEE DWG. 2260 SHT. M-1
7. LEVEL PRESSURE TRANSDUCER JUNCTION BOX LOCATED BETWEEN PUMPS.
8. SEE DWG. 2260 SHT. M-1
9. ELECTRICAL SERVICE IS SIZED BASED ON ONE PUMP RUNNING AT A TIME WITH FULL REDUNDANCY OFF 2ND PUMP. ELECTRICAL CALCULATIONS NOT INTENDED TO SUPPORT BOTH PUMPS RUNNING SIMULTANEOUSLY.
9. USE THHN #12, 600V STANDARD COOPER WIRE.
10. 1-BK, 1-WH, 1-GN (FOR ALL 120V FEEDS TO LIGHTS/RECEPT./FANS/RADIO TELEMETRY.
11. PUMP STATION BUILDING IS UNCLASSIFIED.
12. COORDINATE AND SUPPORT FLOAT CABLES NEAR ACCESS HATCH FOR REMOVAL & REPLACEMENT.

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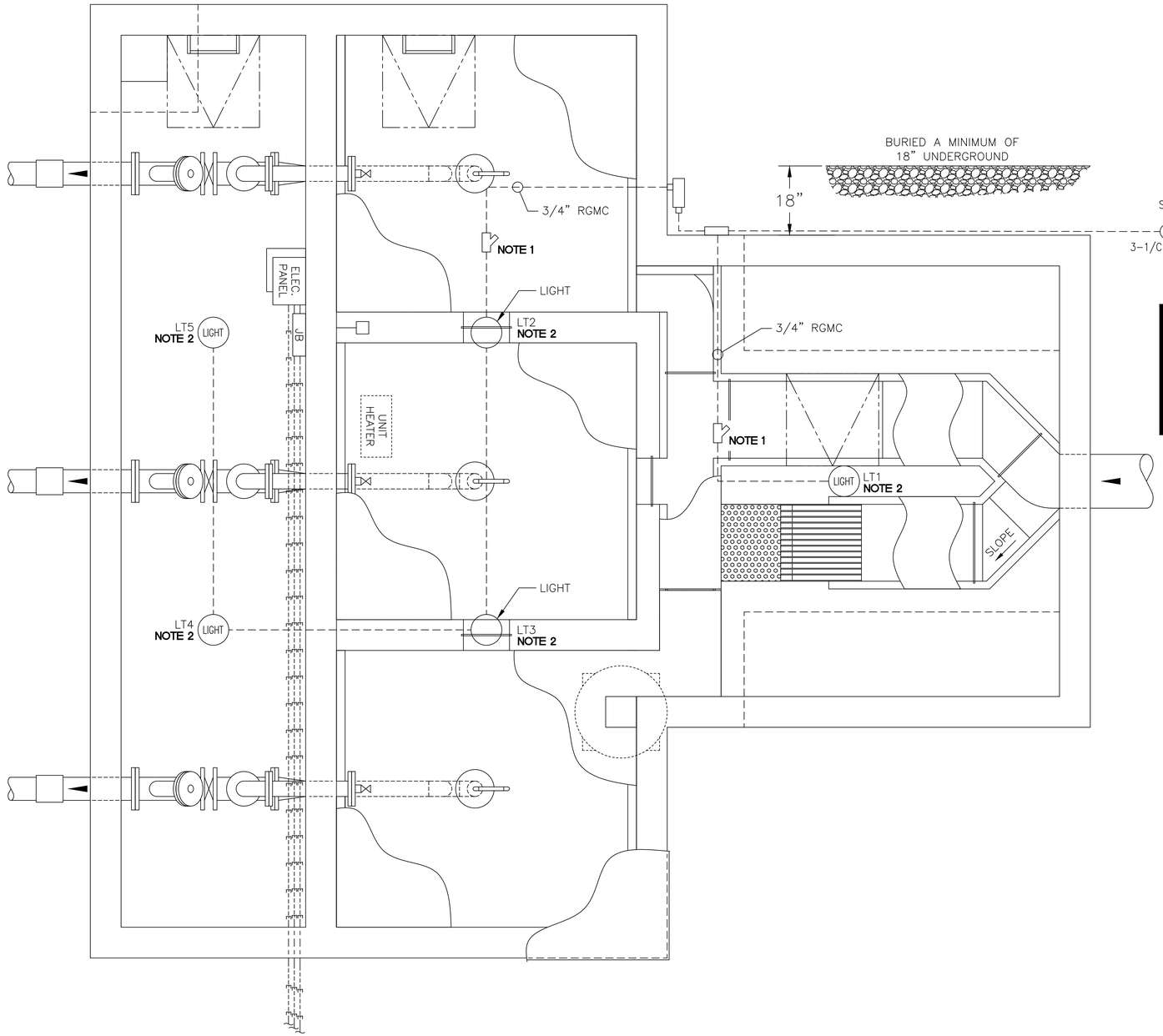
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION EQUIPMENT POWER, CONTROL, AND INSTRUMENTATION PLAN

SCALE: 1/2"=1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET:20245E007

SIPHON STRUCTURE LIGHTING PLAN
(ALTERNATE BID NO.2)



NOTE:
ALL WORK ON THIS DRAWING
IS PART OF ALTERNATE BID NO.2.
SEE PROJECT NO.2264
SH. D-1 FOR DETAILS.

NOTES:

1. USE SEAL-OFF FITTINGS PER CLASS 1, DIV. 1 PER NEC SEAL SHALL BE WITHIN 10' OF BOUNDARY AND CONTAIN UNLONG COUPLINGS OR BOXER
2. LIGHTING FIXTURES SHALL BE CLASS 1, DIV. 1
3. MINIMUM BURIAL 18" PER NEC TABLE 300.5

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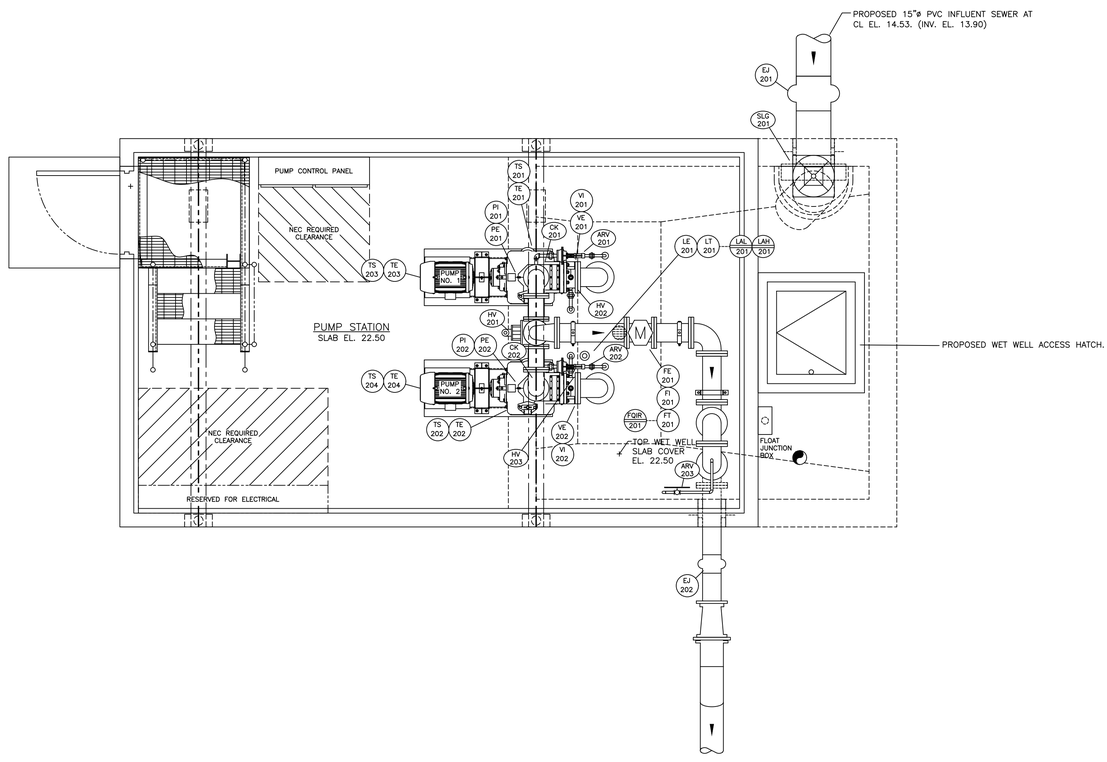
TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

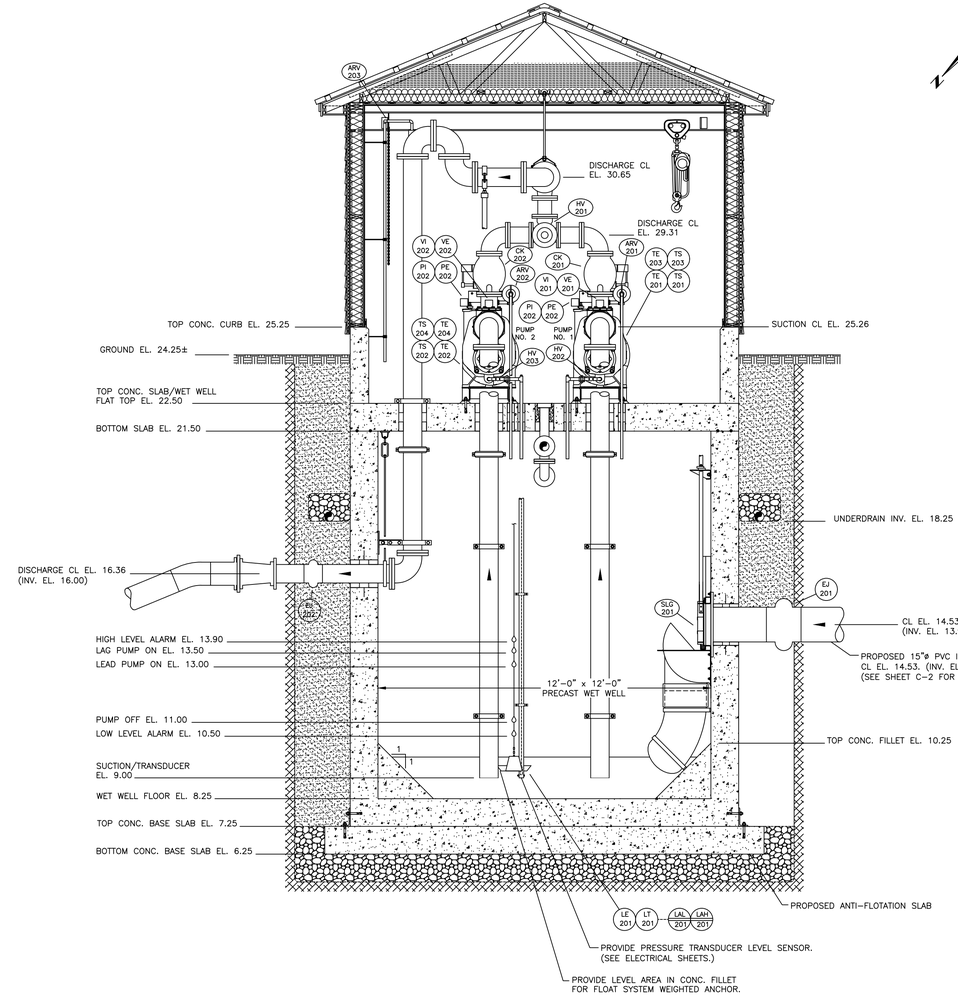
SIPHON STRUCTURE LIGHTING PLAN DIAGRAM

SCALE: 3/4"=1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E008



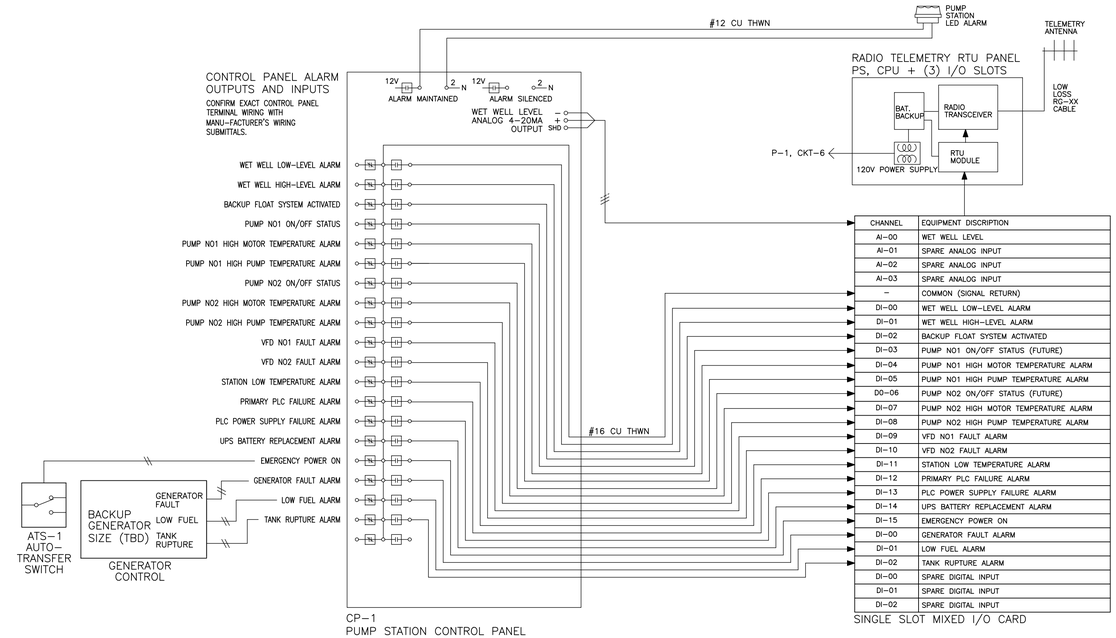
1 E009 PUMP STATION PLAN

SCALE 3/8"=1'-0"



2 E009 PUMP STATION MECHANICAL SECTION

SCALE 3/8"=1'-0"



CHANNEL	EQUIPMENT DISCRIPTION
AI-00	WET WELL LEVEL
AI-01	SPARE ANALOG INPUT
AI-02	SPARE ANALOG INPUT
AI-03	SPARE ANALOG INPUT
–	COMMON (SIGNAL RETURN)
DI-00	WET WELL LOW-LEVEL ALARM
DI-01	WET WELL HIGH-LEVEL ALARM
DI-02	BACKUP FLOAT SYSTEM ACTIVATED
DI-03	PUMP NO1 ON/OFF STATUS (FUTURE)
DI-04	PUMP NO1 HIGH MOTOR TEMPERATURE ALARM
DI-05	PUMP NO1 HIGH PUMP TEMPERATURE ALARM
DO-06	PUMP NO2 ON/OFF STATUS (FUTURE)
DI-07	PUMP NO2 HIGH MOTOR TEMPERATURE ALARM
DI-08	PUMP NO2 HIGH PUMP TEMPERATURE ALARM
DI-09	VFD NO1 FAULT ALARM
DI-10	VFD NO2 FAULT ALARM
DI-11	STATION LOW TEMPERATURE ALARM
DI-12	PRIMARY PLC FAILURE ALARM
DI-13	PLC POWER SUPPLY FAILURE ALARM
DI-14	UPS BATTERY REPLACEMENT ALARM
DI-15	EMERGENCY POWER ON
DI-00	GENERATOR FAULT ALARM
DI-01	LOW FUEL ALARM
DI-02	TANK RUPTURE ALARM
DI-00	SPARE DIGITAL INPUT
DI-01	SPARE DIGITAL INPUT
DI-02	SPARE DIGITAL INPUT

SINGLE SLOT MIXED I/O CARD

3 E009 ALARM RISER DIAGRAM

SCALE NONE

SOUTH SIDE PUMP STATION

TELEMETRY SYMBOL LEGEND

- DEVICE BLOCK
- CONNECTION
- NO CONNECTION
- 2 CONDUCTORS & GROUND
- SHIELDED TWISTED PAIR
- SHIELDED TWISTED PAIR INDIVIDUAL CONDUCTORS
- PANEL AS NOTED
- CONTROL RELAY, N. O. CONTACTS
- CONTROL RELAY, N. C. CONTACTS
- RED LED ALARM LIGHT
- NON-MERCURY FLOAT SWITCH
- POWER SUPPLY MODULE
- DIRECTIONAL YAGI ANTENNA

GENERAL NOTES, TELEMETRY

1. LAY OUT NEW EQUIPMENT LOCATIONS IN FIELD WITH ENGINEER.
2. OTHER DEVICES SHOWN FOR COORDINATION PURPOSES ONLY.
3. ALIGN DEVICES ON VERTICAL & HORIZONTAL CENTERS WHERE PRACTICAL.
4. ALL SCREWS, FASTENERS & OTHER HARDWARE TO BE SS.
5. ROUTE INPUT AND OUTPUT LOW LEVEL SIGNALS IN SEPARATE CONDUITS AS SHOWN. DO NOT COMBINE WITHOUT PRIOR AUTHORIZATION OF ENGINEERS.
6. ALL CONTROLS SHALL BE WIRED WITH CLASS 1 WIRING METHODS REGARDLESS OF VOLTAGE FOR SECURE AND PROTECTED CONNECTIONS.
7. TEST ALL CONTROL CIRCUITS FOR SHORTS BEFORE CONNECTING TO DEVICES.
8. FIELD LOCATE BACK-UP FLOAT SYSTEM NEAR ACCESS HATCH FOR EASE OF RETRIEVAL.

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ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

11/29/22	FOR BID
DATE	ADDITION OR REVISION

DES.BY:	BJS	DR.BY:	HEM	CK.BY:	EWH

TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION ELECTRICAL PLAN, SECTION & TELEMETRY DETAILS

SCALE: 3/8"=1'-0"	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E009

4 NEW ALARM CHANNELS & 1 NEW ANALOG CHANNELS WIRED DIRECTLY FROM NEW RADIO TELEMETRY PANEL

INPUTS ARE RECEIVED OVER MODBUS CONNECTION FROM PLC-2 FOR DISPLAY ON THIS PANEL. (1) NEW ALARM WIRED DIRECTLY FROM NEW RADIO TELEMETRY PANEL

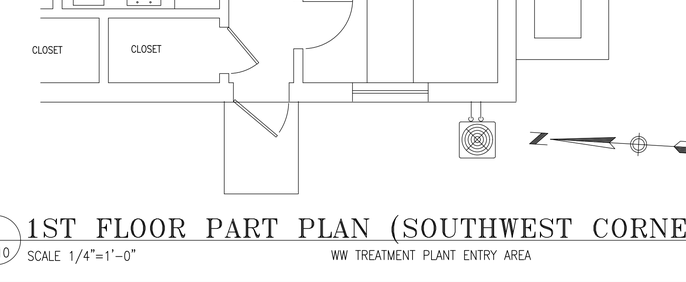
CSO STATION PANEL ALARM	CSO GATE ALARM	GRINDER FAILURE	GRIT CHAMBER BLOWER 4 FAILURE	INFLUENT PANEL ALARM	(SPARE)
CSO HIGH LEVEL				INFLUENT HIGH LEVEL	(SPARE)
CSO LOW LEVEL				INFLUENT LOW LEVEL	(SPARE)
AERATION BLOWER 1 FAILURE	AERATION BLOWER 2 FAILURE	AERATION BLOWER 3 FAILURE	CLARIFIER 1 HIGH TORQUE ALARM	CLARIFIER 2 HIGH TORQUE ALARM	CLARIFIER 3 HIGH TORQUE ALARM
BLOWER 5 FAILURE	SCUM TANK CONTROLS ALARM	AERATED SLUDGE STORAGE HIGH LEVEL	SLUDGE THICKENER HIGH LEVEL	LIME MIXER HIGH LEVEL	(SPARE)
BLOWER 6 FAILURE	SCUM TANK HIGH LEVEL				
BLOWER 7 FAILURE	SCUM TANK LOW LEVEL	AERATED SLUDGE STORAGE LOW LEVEL	SLUDGE THICKENER LOW LEVEL	LIME MIXER LOW LEVEL	(SPARE)
RAS/WAS PUMP 1 FAILURE	RAS/WAS PUMP 2 FAILURE	RAS/WAS PUMP 3 FAILURE	TAS PUMP FAILURE	OUTFALL TANK TRANSDUCER HIGH LEVEL	EFFLUENT PANEL ALARM
				OUTFALL TANK FLOAT HIGH LEVEL	EFFLUENT HIGH LEVEL
				OUTFALL TANK GATE ALARM	EFFLUENT LOW LEVEL
HEADWORKS FLOODED	SOUTH SIDE PUMP STATION	BOILER LOW ANTIFREEZE	CHLOR RM LOW TEMP	GENERATOR GENERAL ALARM	AMETEK: SIL, ACK, TEST, RESET
INFLUENT PUMP ROOM FLOODED	EXIST. EAST SIDE EXT. PUMP STATION	BUILDING LOW TEMPERATURE	DECHLOR RM LOW TEMP	LOW FUEL	
RAS/WAS PUMP ROOM FLOODED				TANK RUPTURE	

CONNECT SINGLE NEW ALARM FROM RADIO TELEMETRY SYSTEM TO EXISTING PANALARM ANNUNCIATOR PANEL. PROVIDE NEW ENGRAVING FOR EXISTING BLANK PANE.

ZETRON

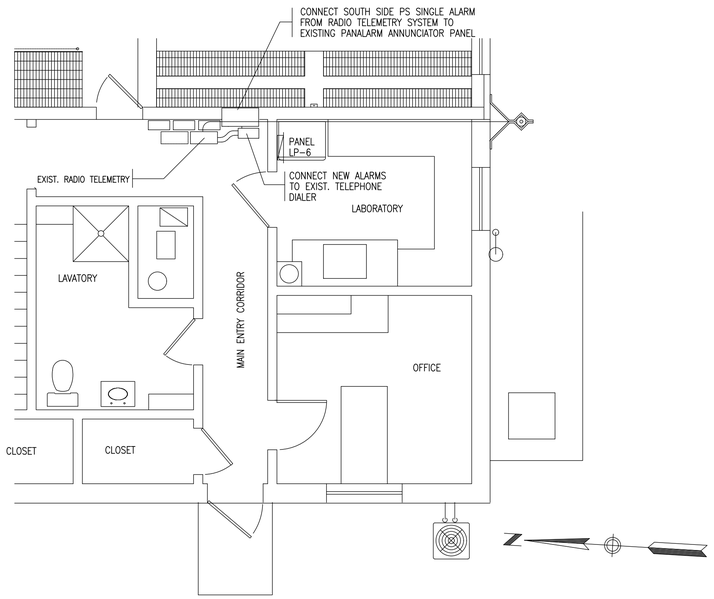
3 ANNUNCIATOR PANEL DETAIL

3 / E010 SCALE: NONE — ON INSTRUMENT WALL



2 INSTRUMENT CORRIDOR EAST ELEVATION

2 / E010 SCALE 1/2"=1'-0" — WW TREATMENT PLANT ENTRY AREA



1 1ST FLOOR PART PLAN (SOUTHWEST CORNER)

1 / E010 SCALE 1/4"=1'-0" — WW TREATMENT PLANT ENTRY AREA

EXIST. OMNI-DIRECTIONAL ANTENNA ~25' HEIGHT ABOVE GRADE

EXIST. RADIO TELEMETRY PANEL IN NEMA 1 ENCLOSURE IN WW PLANT INSTRUMENT CORRIDOR

EXIST. LP5-16

TRANSCEIVER

BATTERY

LOW LOSS RG-XX RF CABLE

EXIST. RADIO TRANSCEIVER, 120V POWER SUPPLY WITH BATTERY BACKUP, TELEMETRY CPU MODULE AND 7 SLOT RACK FOR I/O CARDS.

ACE 3600 POWER SUPPLY MODULE	ACE 3610/3640 CPU MODULE	1	2	3	4	5	6	7
		8 CHANNEL ANALOG 4-20MA OUTPUT MODULE 1	(SPACE)	16 RELAY DIGITAL OUTPUT MODULE 3	16 RELAY DIGITAL OUTPUT MODULE 4	(SPACE)	(SPACE)	(SPACE)

EXISTING INPUTS FROM PLANT ALARMS

EXISTING ANNUNCIATOR PANEL

POINT	PLANT ALARM DESCRIPTION
1	CSO STATION PANEL ALARM
2	CSO HIGH LEVEL
3	CSO LOW LEVEL
4	CSO GATE ALARM
5	GRINDER FAILURE
6	GRIT CHAMBER BLOWER 4 FAILURE
7	INFLUENT PANEL ALARM
8	INFLUENT HIGH LEVEL ALARM
9	INFLUENT LOW LEVEL ALARM
10	(SPARE)
11	(SPARE)
12	(SPARE)
13	AERATION BLOWER 1 FAILURE
14	AERATION BLOWER 2 FAILURE
15	AERATION BLOWER 3 FAILURE
16	CLARIFIER 1 HIGH TORQUE ALARM
17	CLARIFIER 2 HIGH TORQUE ALARM
18	CLARIFIER 3 HIGH TORQUE ALARM
19	BLOWER 5 FAILURE
20	BLOWER 6 FAILURE
21	BLOWER 7 FAILURE
22	SCUM TANK CONTROLS ALARM
23	SCUM TANK HIGH LEVEL ALARM
24	SCUM TANK LOW LEVEL ALARM
25	AERATED SLUDGE STORAGE HIGH LEVEL
26	AERATED SLUDGE STORAGE LOW LEVEL
27	SLUDGE THICKENER HIGH LEVEL
28	SLUDGE THICKENER LOW LEVEL
29	LIME MIXER HIGH LEVEL
30	LIME MIXER LOW LEVEL
31	(SPARE)
32	(SPARE)
33	RAS/WAS PUMP 1 FAILURE
34	RAS/WAS PUMP 2 FAILURE
35	RAS/WAS PUMP 3 FAILURE
36	TAS PUMP FAILURE
37	OUTFALL TANK TRANSDUCER HIGH LEVEL
38	OUTFALL TANK TRANSDUCER FLOAT LEVEL
39	OUTFALL TANK GATE ALARM
40	EFFLUENT PANEL ALARM
41	EFFLUENT HIGH LEVEL ALARM
42	EFFLUENT LOW LEVEL ALARM
43	HEADWORKS FLOODED
44	INFLUENT PUMP ROOM FLOODED
45	RAS/WAS PUMP ROOM FLOODED
46	SOUTH SIDE PUMP STATION
47	EXIST. EAST SIDE EXT. PUMP STATION ALARM
48	BOILER LOW ANTI-FREEZE
49	BUILDING LOW TEMPERATURE
50	CHLORINE ROOM LOW TEMPERATURE
51	DECHLOR ROOM LOW TEMPERATURE
52	GENERATOR GENERAL ALARM
53	GENERATOR LOW FUEL ALARM
54	GENERATOR TANK RUPTURE ALARM

CONNECT SINGLE ALARM FROM RADIO TELEMETRY SYSTEM TO EXIST. PANALARM ANNUNCIATOR PANEL

EXIST. ZETRON SENTRIMAX MODEL1550

DOMESTIC PS BOARD — 120VAC INPUT

MAIN BOARD — J1-PHONE RJ11C: NC, NC, RING, TIP, NC, NC — TO PHONE

EXIST. TO TELEPHONE NETWORK

ADD TAPI CHIP SET TO DIALER FOR NUMERICALLY CODED PAGE ALERTS. PROGRAM ALARM PROCESSOR TO OUTPUT SEQUENTIAL (1 THRU 64) CHANNEL CODES FOR EACH CURRENT AND FUTURE ALARM POINT.

#900 — LP5-16

EXISTING 0-5VDC /4-20MA INPUT

CONNECT NEW ANALOG SIGNAL INPUT

DIGITAL I/O BOARD (I/O 1 – I/O 16, GND) — DIGITAL I/O BOARD — DIGITAL I/O BOARD — DIGITAL I/O BOARD

WIRE NEW SOUTH SIDE PUMP STATION ALARMS AND FIELD VERIFY WITH SPARE CHANNELS

4 ALARM CIRCUIT SCHEMATIC & SCHEDULE

4 / E010 SCALE: NONE — AT WW TREATMENT PLANT

NEW RADIO TELEMETRY OUTPUTS AT WW PLANT

CHANNEL	EQUIPMENT DISCRIPTION
AO-00	WET WELL LEVEL
AO-01	SPARE ANALOG OUTPUT
AO-02	SPARE ANALOG OUTPUT
AO-03	SPARE ANALOG OUTPUT
AO-04	SPARE ANALOG OUTPUT
AO-05	SPARE ANALOG OUTPUT
AO-06	SPARE ANALOG OUTPUT
AO-07	SPARE ANALOG OUTPUT
DO-00	WET WELL LOW-LEVEL ALARM
DO-01	WET WELL HIGH-LEVEL ALARM
DO-02	BACKUP FLOAT SYSTEM ACTIVATED
DO-03	PUMP NO1 ON/OFF STATUS (FUTURE)
DO-04	PUMP NO1 HIGH MOTOR TEMPERATURE ALARM
DO-05	PUMP NO1 HIGH PUMP TEMPERATURE ALARM
DO-06	PUMP NO2 ON/OFF STATUS (FUTURE)
DO-07	PUMP NO2 HIGH MOTOR TEMPERATURE ALARM
DO-08	PUMP NO2 HIGH PUMP TEMPERATURE ALARM
DO-09	VFD NO1 FAULT ALARM
DO-10	VFD NO2 FAULT ALARM
DO-11	STATION LOW TEMPERATURE ALARM
DO-12	PRIMARY PLC FAILURE ALARM
DO-13	PLC POWER SUPPLY FAILURE ALARM
DO-14	UPS BATTERY REPLACEMENT ALARM
DO-15	EMERGENCY POWER ON
DO-00	GENERATOR FAULT ALARM
DO-01	LOW FUEL ALARM
DO-02	TANK RUPTURE ALARM
DO-03	SPARE DIGITAL OUTPUT
DO-04	SPARE DIGITAL OUTPUT
DO-05	SPARE DIGITAL OUTPUT
DO-06	SPARE DIGITAL OUTPUT

EXIST. ZETRON SENTRIMAX INDUSTRIAL ALARM PROCESSOR

ANALOG INPUT	0-5VDC/4-20MA	
CH 1	WET WELL LEVEL	ANALOG SIGNALS TO BE ACCESSED ON LCD PANEL.
CH 2	SPARE	
CH 3	SPARE	
DIGITAL INPUT		
CH XX	STATION WET WELL LEVEL ALARM	
CH XX	STATION PUMP FAILURE	
CH XX	STATION LOW TEMPERATURE ALARM	
CH XX	STATION ELECTRICAL/GENERATOR ALARM	

ALL SIGNALS TRANSMITTED TO WW PLANT FOR SEGREGATION AT FUTURE SCADA TERMINAL DISPLAY. FOR THIS PROJECT, PARALLEL OUTPUT CHANNELS, AS INDICATED, FOR COMMON ALARM POINT.

NOTE:
XX CHANNELS TO BE DETERMINED AT RADIO INSTALLATION

CH	ANALOG EQUIPMENT DESCRIPTION
01	_
02	_
03	_
04	STATION WET WELL LEVEL

NEW ANALOG INPUT WIRED DIRECTLY TO DIALER

CH	DIGITAL EQUIPMENT DESCRIPTION
CH XX	STATION WET WELL LEVEL ALARM
CH XX	STATION PUMP FAILURE
CH XX	STATION LOW TEMPERATURE ALARM
CH XX	STATION ELECTRICAL/GENERATOR ALARM

NEW DIGITAL INPUTS WIRED DIRECTLY TO DIALER

5 SIGNAL REDUCTION TO DIALER

5 / E010 SCALE NONE — AT WW TREATMENT PLANT

STATE OF MAINE — MARK P. BOLDUC — No. 7268 — REGISTERED PROFESSIONAL ENGINEER

The Fitch Company
580 PROSPECT AVE. RUMFORD, ME. (207) 364-7441
4 YARMOUTH RD. GRAY, ME. (207) 657-5226
631 HAMMOND ST. BANGOR, ME. (207) 947-3932

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

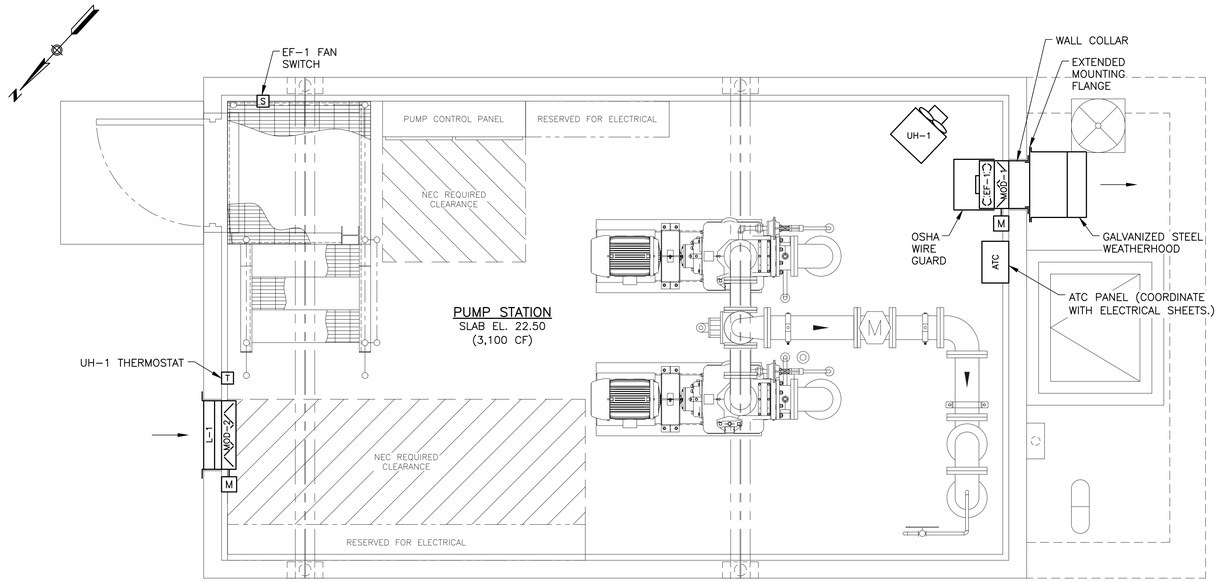
11/29/22	FOR BID		
DATE	ADDITION OR REVISION		
DES.BY: BJS	DR.BY: HEM	CK.BY: EWH	

TOWN OF MACHAIS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

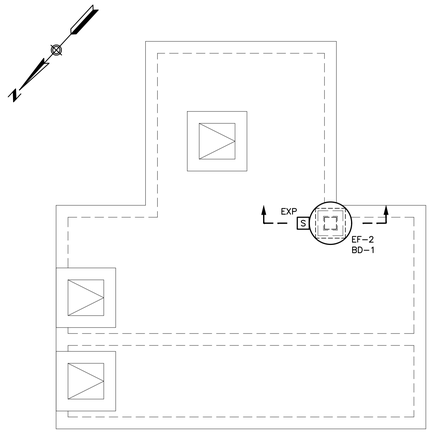
MACHIAS WW TREATMENT PLANT TELEMETRY PLANS & DETAILS

SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER 2022	SHEET: 20245E010



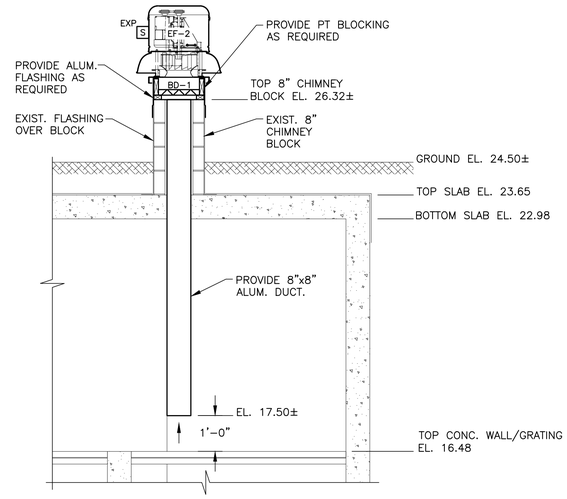
HEADWORKS HVAC PLAN

SCALE: 1/2" = 1'-0"



SIPHON INFLUENT CHAMBER HVAC PLAN (ALTERNATE BID NO. 2)

SCALE: 1/4" – 1'-0"



SIPHON INFLUENT CHAMBER HVAC SECTION (ALTERNATE BID NO. 2)

SCALE: 1/2" – 1'-0"

HVAC SPECIFICATIONS

1. DUCTWORK

   A. ALL DUCTWORK SHALL CONFORM TO ASHRAE DUCT CONSTRUCTION RECOMMENDATIONS, SMACNA "LOW VELOCITY DUCT CONSTRUCTION STANDARDS" FOR ALUMINUM DUCTWORK AND APPLICABLE NFPA REQUIREMENTS.

   B. DUCTWORK SHALL BE ALL ALUMINUM CONSTRUCTION AND SEALED WITH DUCT SEALANT EQUAL TO AIRSEAL #33.

   C. DUCT PENETRATIONS SHALL BE GAS TIGHT AND SEALED BY CDS SEALING SYSTEMS OR EQUAL.

2. TESTING & BALANCING

   A. ALL HVAC EQUIPMENT SHALL BE BALANCED BY AN INDEPENDENT CONTRACTOR AT THE FLOWS SPECIFIED.

3. CONTROLS

   A. EF-1 DESCRIPTION OF OPERATION:

      a. EF-1 SHALL BE CONTROLLED BY A WALL MOUNTED SWITCH ON THE INTERIOR OF THE BUILDING.

      b. THE WALL MOUNTED INTERIOR SWITCH FOR EF-1 SHALL BE THREE (3) POSITION; OFF-UNOCCUPIED-OCCUPIED.

      c. WITH THE WALL MOUNTED SWITCH FOR EF-1 IN THE UNOCCUPIED POSITION, EF-1 SHALL RUN AT THE UNOCCUPIED RATE OF 355 CFM.

      d. WITH THE WALL MOUNTED SWITCH FOR EF-1 IN THE OCCUPIED POSITION, EF-1 SHALL RUN AT THE OCCUPIED RATE OF 710 CFM.

      e. COORDINATE DAMPER END SWITCHES WITH FAN START CIRCUIT TO START THE FANS WHEN THE DAMPERS ARE OPEN.

      f. EF-1 SHALL INCLUDE FAN MANUFACTURER'S OPTIONAL 2-SPEED CONTROLLER.

   B. EF-2 DESCRIPTION OF OPERATION:

      a. EF-2 SHALL BE CONTROLLED BY AN EXTERIOR SWITCH MOUNTED AT THE FAN.

      b. THE EXTERIOR SWITCH MOUNTED AT THE FAN SHALL BE TWO (2) POSITION; ON-OFF.

      c. IN THE ON POSITION, EF-2 SHALL RUN AT THE RATE OF 1,015 CFM.

4. FANS

   A. FANS SHALL HAVE THERMAL OVERLOAD PROTECTION.

   B. FANS SHALL INCLUDE ALL NECESSARY SCREENS AND OR GUARDS AS REQUIRED IN COORDINATION WITH OSHA STANDARDS.

   C. FANS SHALL INCLUDE MANUFACTURER'S VIBRATION ISOLATION OPTIONS AND FEATURES FOR DESIGNATED APPLICATION.

   D. EF-1 SHALL INCLUDE ECM MOTOR OPTION AND BE COORDINATED WITH FAN MANUFACTURER'S 2-SPEED CONTROLLER.

DAMPER/LOUVER SCHEDULE

UNIT	SERVES	MANUFACTURER	MODEL	SIZE	NOTES
L-1	PUMP STATION	POTTORFF	EFD-637	24"x24"	2
MOD-1	PUMP STATION	TAMCO	9000 SERIES DAMPER	16"x16"	1, 2
MOD-2	PUMP STATION	TAMCO	9000 SERIES DAMPER	24"x24"	1, 2
BD-1	SIPHON INFLUENT CHAMBER (ALTERNATE BID NO. 2)	LOREN COOK	BD-14 DAMPER	13 3/4"x13 3/4"	2

DAMPER/LOUVER SCHEDULE NOTES:

1) MOTORIZED DAMPER OPERATORS SHALL INCLUDE DAMPER END SWITCHES TO COORDINATE WITH FAN START CONTROL CIRCUIT. COORDINATE WITH CONTROL DESCRIPTION OF OPERATION.

2) DAMPERS AND LOUVERS SHALL BE ALL ALUMINUM CONSTRUCTION, ANODIZED FINISH.

FAN SCHEDULE

UNIT	SERVES	CFM	T.S.P. " W.C.	MANUFACTURER	MODEL	HP	POWER	NOTES
EF-1	PUMP STATION	355/710	0.25"	LOREN-COOK	12XW32D17(VF)	1/8	120v/1PH/60HZ	1, 3, 4
EF-2	SIPHON INFLUENT CHAMBER (ALTERNATE BID NO. 2)	1,015	0.25"	LOREN-COOK	120C3B	1/4	120v/1PH/60HZ	2, 5

FAN SCHEDULE NOTES:

1) ECM MOTOR FOR 2-SPEED CONTROL, COORDINATE WITH 2-SPEED CONTROLLER PROVIDED BY MANUFACTURER.

2) EXPLOSION PROOF

3) PROVIDE EPOXY POWDER COAT FINISH OPTION ON STEEL COMPONENTS FOR CORROSION RESISTANCE.

4) PROVIDE GALVANIZED STEEL WEATHERHOOD.

5) PROVIDE PHENOLIC EPOXY POWDER COAT FINISH.

HEATER SCHEDULE

UNIT	SERVES	TYPE	MANUFACTURER	MODEL	THROW (FT)	CFM	HP	KW	NOTES
UH-1	PUMP STATION	HOR	TRANE	UHEL-203DACA	32'	1,100	1/20	20	–

NOTES:

1) COORDINATE ALL HVAC WORK WITH STRUCTURAL, PLUMBING, AND ELECTRICAL SHEETS.

2) IN PUMP STATION BUILDING ALL HARDWARE, FASTENERS, CONDUIT SUPPORTS AND HANGERS SHALL BE 304 SS, GALVANIZED STEEL OR MANUFACTURER'S CORROSION RESISTANT FINISH.

3) IN SIPHON INFLUENT CHAMBER AND ASSOCIATED EXTERIOR EQUIPMENT, ALL HARDWARE, FASTENERS, CONDUIT SUPPORTS AND HANGERS SHALL BE 316 SS.

4) WIRE ALL DEVICES AND EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.

5) PROVIDE ALL TRANSITIONING DUCTWORK, HARDWARE AND APPURTENANCES AS REQUIRED FOR COMPLETE VENTILATION SUPPLY AND EXHAUST ASSEMBLIES AS REQUIRED BY MANUFACTURER.

6) CONTRACTOR SHALL COORDINATE ALL CONDUIT AND WIRING REQUIREMENTS FOR EXHAUST FAN AND DAMPERS WITH SUBMITTED ATC CONTROL PANEL WIRING SCHEMATICS.

STATE OF MAINE
ANNALEIS HAFFORD
No. 11562
LICENSED PROFESSIONAL ENGINEER

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION

DES.BY: EWH	DR.BY: NWD	CK.BY: AH

TOWN OF MACHIAS, MAINE

SOUTH SIDE PUMP STATION INSTALLATION

PUMP STATION AND SIPHON INFLUENT CHAMBER HVAC PLAN, SECTION, AND SCHEDULES

SCALE: AS NOTED	PROJECT NO.: 2260
DATE: OCTOBER, 2022	SHEET: HVAC-1

APPENDIX 11 – PUBLIC MEETING TRANSCRIPTS

1. 12/16/2009 - Initial Public Meeting Minutes
2. 4/2/2018 - Preliminary Public Meeting Minutes
3. 3/29/21 – Virtual Public Meeting Comments
4. 6/28/2022 – Public Meeting Minutes

MAINE DEPARTMENT OF TRANSPORTATION

PRELIMINARY PUBLIC MEETING IN MACHIAS, THE REPLACEMENT OF DYKE BRIDGE.

PROJECT MANAGER: DEVIN ANDERSON

UNIVERSITY OF MAINE MACHIAS CAMPUS
MACHIAS, MAINE
DECEMBER 16, 2009
6:06 P.M.

DON THOMPSON & ASSOCIATES
MELISSA L. THIBODEAU, RPR

(This hearing was taken before Melissa L. Thibodeau, RPR, Notary Public, at the University of Maine Machias Campus, 116 O'Brien Avenue, Machias, Maine, on December 16, 2009, beginning at 6:06 p.m.)

* * * * * *

MR. ANDERSON: Good evening, folks. My name is Devin Anderson. I'm the project manager with the Maine DOT for the Machias Dyke Bridge replacement project. We're here tonight to gather information, hear your questions and concerns about this proposed project. I have quite a few folks here with us tonight.

Mike Wight is the designer for Maine DOT. Judy Gates works in our environmental office or is in charge of our environmental office. I have, is it Tom Schaeffer with Maine Fish & Wildlife. Mark Lickus is a soil scientist specialist with Maine DOT. Wende Mahaney is with Inland Fish & Wildlife from the federal section. I have Trent Liebich with NOAA. And Ernie Atkinson with the Department of Marine Resources, Bureau of Sea-Run Fisheries.

Is there anybody I have missed from the agencies? Okay. Good. I have got everybody.

The purpose for this meeting is to notify the public of a proposed project and give the public the

opportunity to ask questions, make comments. This is a significant project, as you can see by the turnout here tonight, in your area.

I have a sign-up sheet. Hopefully everybody's signed in. I think it's still floating around the back right now. I'd appreciate it if you would sign in. It gives us a record of who was at our meeting. It helps the court reporter when she's filling out her records and stuff.

Notifications went out in the local papers. They go out to any abutters and they go out to your local and state representatives for the area for the project. Copies are in the local papers. I have a few spare copies of the notice up front here. What that has on it is it has my name, my phone number, and my email address on it. If anybody has questions, concerns, comments, needs to send information to me, sending it by email is probably the best way, but you're more than welcome to call and ask questions.

The court reporter is Melissa Thibodeau with Don Thompson & Associates. She is taking records of this meeting tonight so I can run the meeting and listen to your questions and I will have a record and know what questions you asked later.

What we do ask is that you let us give our

presentation about the project first and then we will open it up and listen to all your questions, comments, concerns as to how this might affect things. History, we want to know what the history is of the area, flooding, things like that.

Again, our purpose here tonight is to do this public meeting with you folks, to share what information that we have at this time. We're going to talk about impacts, which typically are right-of-way, utilities, traffic, how -- if we're going to replace a bridge or something, the traffic's because you either have to shut down a road or stage construction and build it in halves and that -- in this case, it would probably be stage construction, if we were going to build something here because this is the main route and it's a long way to get around.

Environmental, any environmental concerns, historical properties. There is -- I'm sure there are other concerns that I haven't listed on here.

Again, we're looking for any questions, concerns, comments, feedback that you folks can give us about this area for this project.

We're going to talk about the condition of your existing bridge, the Dyke Bridge on Route 1 over the Middle River.

I've introduced pretty much the entire crew of folks that are -- I will call them specialists.

Again, we will open the meeting up for questions at the end.

This project is -- it's currently in a two-year work plan. And what that is -- and that's 2010, 2011. What that is is every two years the Maine Department of Transportation goes out and we inspect every bridge in the state. And the ones that we find that are in the worse shape, we take a look at them and we determine which ones are going to get funded for us to look at how to replace them and get them into our system so that we can replace them before they fail.

This project is funded right now for a quarter of a million dollars and that quarter of a million dollars is for preliminary engineering to figure out what to do, how to replace this bridge in your community. All construction money for this project will be in a future program. And the earliest that that program would be would be 2012, 2013. And, again, it competes with all the other bridges in the state of Maine for those funds.

With that I'm going to let Mike give you folks a -- some information on the condition of the existing bridge, although I am going to -- I guess I should

step back one step.

This location, this bridge, the Dyke Bridge that you have here in Machias is -- basically, there are two different alternatives for -- for replacing this bridge. The first alternative would be to put something similar back into what you have right now so the saltwater is going to stay out and the freshwater is going to find its way through at low tide.

The second option would be to put a traditional bridge in with a regular span and allow saltwater to freely flow back up into the area that it hasn't been in for 80 or 100 years since the flapper valves, which is basically a concrete gate that flips up when the water is going out at low tide, the freshwater -- allows it out and when the tide comes back in, it drops back and prevents the saltwater from moving back up through the bridge.

With that, Mike, go ahead.

MR. WIGHT: Thank you, Devin. Devin stated this is kind of a preliminary meeting. We really haven't done any -- a lot of engineering. I have a few facts to present.

And the first big issue I'd like to talk about is purpose and need and why we're here working on this particular project. As Devin mentioned, it's

currently in our two-year plan or what we call BTIP, but to get to the point of actually getting funding in the BTIP, any bridge project goes through a long process. We have a series of documents or steps a project has to go through.

The Department has a 20-year plan, which is the basic framework of what projects we're going to work on and how we're going to spend our money, how we divide it up between roads, bridges, ports, airports, and the whole mode -- different modes of transportation.

Once we have this big framework of what we call a 20-year plan, we have what's called a 6-year plan and that's where we actually list projects, hopefully within 6 to 8 years we'll actually get to. And then once we get that short list of what we call the 6-year plan, we go through a process and whittle it down to projects that actually get into what we call our 2-year plan, projects that are actually getting funding.

And generally we have about twice as much need as we have money, so we go through -- we basically go out and look at projects that are high on the priority list and make a selection. And this project has basically made it through that whole process to get funding for preliminary engineering.

This particular bridge was actually built in two phases, the original piece of bridge, the upstream piece, was built in 1930. That piece is 79 years old. In 1946 the box culverts here were extended, just about doubled the length of them. And that was in 1946. So this downstream piece is about 63 years old.

And we have a library of about 40 pictures from the '30s and '40s. This is one of them. You folks can look at it at the end of the meeting, but what looks like what happened when they built this is they slowly filled in from both sides over the years and they filled it in with what we call timber cribbing. They make some piled logs in a criss-cross pattern and filled it in with rocks. And basically when we were down there, they had this whole area filled right in.

Every bridge that we inspect, we also have what we call a federal highway sufficiency rating. We rate bridges from 0 to 100. This bridge has a rating of what we call a 48, which means any bridge under 50 is eligible for replacement. This number kind of gives a relative idea of what the condition of the bridge is.

And the big reason we're here, this bridge is considered structurally deficient. This structure has some elements that are in serious condition, and I will point out a couple of them.

Probably the biggest problem we have here is there is some rot, minor to moderate rot in the timber members. Another big problem at this particular site there's been a lot of loss of material over the years. You know, the boards sit against each other, but there are gaps, the water can get behind the boards and actually wash away the roadway material. And another big thing is this whole chunk of road essentially acts as a dam. There is a difference in water height especially when the water's up on one side versus the other side.

And if -- I was out there earlier today water was -- it was low tide and the water was down and you can see from where the water is, about 3 or 4 feet up, the water is still seeping through the whole earth and embankment and that seeping process, you know, the very small bits of soil are getting washed through that embankment. And ultimately as a result of losing that material either around the box culverts or in this embankment, there has been a lot of settlement issues.

In the box culvert itself, over the years, the water -- there is a physical abrasion, the water has worn away some of the timber members. And actually about two years ago the State had to do an emergency

repair. Roughly in the middle of the box culvert, there was a lot of settlement, fill issues. We had to go in there and actually put a plate over the top of the box to keep fill material from disappearing. That's probably the biggest reason why the condition of the culverts actually has been decreased.

On a scale of 0 to 9, that's kind of the rating system we use when we inspect bridges, 9 is excellent condition, brand knew, 0 is it's been closed. This bridge is rated 3, which we call that a serious condition.

We've gathered a little data. What you see up on the wall here, our survey crew went out a few months ago and gathered survey information along Route 1 on each side of the bridge. So what you see up here on the wall, this is just -- this is existing conditions. This is nothing proposed. This kind of really light orange is, you know, where Route 1 is. The lighter color is where the parking area and the shoulders are. And this dark green is where there is some vegetation and trees.

So this is right near the bridge site, just so everybody is referenced. This is Helen's Restaurant. There is the old train station. And here's a mini mall where Dunkin' Donuts is.

This right here is an aerial picture showing the bridge site down here and a good part of the drainage basin for the Middle River. And it's tough to see from way up back, but later if you want to come up close, we have contours shown at 20-foot elevations.

In addition to getting the survey, we have gathered some preliminary information. One, is traffic data. This Dyke Bridge is located on Route 1. It's considered a minor arterial. Current traffic counts about 9,154 cars. That's average traffic per day. We're projecting, in about 20 years from now, an increase to about 12,816 cars per day.

We've also gathered accident records for about a three-year period. And for accidents that got officially reported and recorded, there was only one accident on this stretch of road. Somebody was tailgating. So it's a nice, straight, wide stretch. Accident's really aren't a problem.

This chunk of Route 1, the roadway itself is -- you have 2, 12-foot lanes. Each side of it you have roughly 2, 8-foot paved shoulders. In the area of this causeway, there is a strip of parking about 25-feet wide. Then north of that is where the former railroad tracks used to be which are now converted over into a trail. And roughly in the vicinity of the

culvert from the guardrail to the -- just north of the trail, it's about 92 feet wide.

Just to get into a little more detail of what the existing bridge is, if you folks aren't familiar with it, it consists of four timber box culverts that are next to each other. Each box is about 6 feet wide by about 5 and a half feet high. Their total length is about 130 feet. Right now that's about all the information we've gathered.

We just want to go down some list of issues and concerns that we kind of take into account as this project develops. This project's got a variety of issues that are going to make it a challenging site. Devin touched on one earlier. Maintenance of traffic. With the high traffic count, almost 10,000 cars per day, our first thought is we try to maintain two lanes of traffic all the time. In addition at this site, we have a trail that we also have to try to maintain, keep that functioning.

I guess another concern, maybe you folks can comment on is how much pedestrian traffic goes through here. We have to maintain maybe a temporary sidewalk. If you folks could comment on that, that would be great.

And another issue that comes into play with

maintaining traffic, right now we're looking at we'll probably build whatever bridge or culvert we're putting in here in stages. We will build a piece, you know, shift folks over, build another piece and try to maintain, you know, two lanes of traffic and hopefully try to maintain the trail too at the same time.

With the high-traffic count, it would be real tough to -- I mean, driving the roads around here to really re-route cars. We pretty much eliminated that as a feasible option at this point. And because this is kind of a built-up area with businesses real close, it's really tough to try to build a detour on either side. Detours are also really costly.

Another factor we take into account, all of our projects have environmental issues. One of the big ones is, you know, we try to minimize impact to wetlands. We try to minimize impacts to endangered species or rare or threatened species. I'll let some of our partners talk about those issues. Endangered species, salmon are going to come into play in this project.

Another issue is historical and archeological resources. Typically we check when we start a project like, is this the bridge considered historic. Right now the records show the bridge itself is not

considered historic. We also ask the question, are there any historic buildings in the vicinity we want to try to avoid or minimize impacts to. Also are there archeological resources in the area that we want to avoid.

Another big issue we take into account on all our projects is right-of-way impacts. We try to do our best to minimize impacts to abutters. We have a long process. When we do impact abutters, generally that whole process starts with what we call a property owner report. Folks generally in the immediate vicinity of the project are going to get a property owner report. If you get one of those, please fill them out. That report helps us locate, you know, if you have got a tank or a septic field really close to the edge of the road, we can -- if we know where it is, we can possibly work around it. And if your property actually does get abutted, we will be in contact with you.

Another big issue is utilities. Everybody likes to have their electricity and their phone work and the internet. Across the whole causeway here is some aerial poles, some pretty serious utilities. I believe it's power, phone, and cable. We also have some telephone underground.

One big safety issue our contractor has to deal with is the electrical lines. He can't get closer than 10 feet to those electrical lines or basically he's at risk of getting electrocuted, so that's another complication.

In a lot of locations, we try to push the aerial stuff. Take the utility lines, move the poles way out. It's just kind of tough in this location because you've got water on both sides, so that's another issue that we're going to be struggling with on this project.

Another big issue on this project contractibility, how we are actually going to build this project. I think I mentioned that earlier. Underneath the pavement you have basically got a giant pile of wood. It's going to be very difficult for the contractor to actually excavate things. He's going to be pulling out half a forest. The actual construction work is going to be tough because that big pile of timber logs is full of rocks.

And another issue with the contractibility is how do we deal with the water. The contractor likes to have a site that's dry and a lot of -- for some of the construction activities the site needs to be dry. That's a big issue here because of the substantial

tide range, you're going to need a substantial structure to keep the water out. Depending on which alternative we pick, whether we kind of replace it in kind with flapper gates or put a conventional bridge in. That's a big question we've got to weigh is, do we have to keep the saltwater out all of the time, part of the time, or not, but that's a big cost driver. Cofferdams to keep the water back are very expensive. Like any project, cost always weighs in. You know, we only have so much money to go around. Like I mentioned earlier, when we develop our two-year plan and actually pick projects, on the bridge side at least when we are picking bridge projects to work on, generally we're really having a real serious prioritization problem because we've got about twice as many projects as we got money for, so we really seriously weigh, you know, how much work we're going to do here. What's the best bang for our buck, so we can have a cost-effective project.

Another issue is scheduling. We try to make the work go as quickly as we can, but I will forewarn everybody, with all the difficulties of this site, working around utilities, again urban environment, and having to do stage construction, stage construction takes a long time. Minimally this is going to be a

one-season project. It may be a two-season project. But the length of the project really is based on, you know, what option we pick here.

And getting back -- taking a step back a little bit, the bridge is located right here more towards the west end of the causeway. If we replace it in kind, we may replace it to one side or the other of this culvert and maintain water flow through here, make that contractor's life a lot easier. Even if we go with the option of putting in a big bridge, having a big, wide opening, we may also look at the option of, you know, putting that opening to one side or the other. So the proposed bridge may not be exactly here, but it's going to be there or either side of the current opening.

With that, Devin, I'll turn it back over to you.

MR. ANDERSON: Thank you, Mike. One thing that -- one thing that needs to be noted here is the Department of Transportation is going to make sure that you have -- you have the ability when we get done with the project, no matter what option's chose, you're going to have your traffic, your shoulders of your road, you're going to have your trail out here. The parking might get reduced a little bit, but basically we're going to end up having to put back a

very large bridge, width wise here, in order to accommodate the multiple needs for that location. We're not going to comprise your rail trail that's just been established. We're not going to compromise the traveling public, the shoulders of the road, the safety, that part of it, so it's going to be a wide bridge that will go back in here.

I also need to clarify, Maine DOT's purposes is to move people, goods, bicycles, pedestrians, in this case, the rail trail users, from one side to the other. There are two bridge options here. We want to provide the best option to you folks that we can, but we don't really care which type of bridge goes back in. However, we are held to getting permits and stuff for this and there are a lot of other agencies that have to weigh in on this and make sure that the best thing is being done for the environment, for the fish and everything else because these bridges only get replaced once ever 75 to 100 years. So I just want to make sure that I'm clear with you folks about that. In order to build this bridge we have to get permits from a number of other agencies in order to do that.

We've got a quarter of a million dollars to do the preliminary design for this project. That is broken down into federal and state share. The federal

share is 80 percent or 20 -- or $200,000. The state share is 20 percent or $50,000 for a total of $250. After we get done with this meeting, we're going to have to basically digest the information that we get from you folks, the questions and concerns. We've got a lot more information gathering to do and then we are going to come back to you folks again in the spring of 2010 for another meeting to talk about what we've been able to get from the information we've got and give you folks a chance to further that information.

And we're hoping to write a preliminary design report by January of 2011 as to what the recommended structure type to go back in here is. And once we have all of that information together, we will -- we would come back again.

Now, I'm going to -- I am going to be clear here. This project is complicated. I do not expect to have two public meetings for this project, which is what I would normally have on any project. I would come in for a preliminary meeting like this where we have very little information. I would come back for a second meeting where we would know where we were going to go and we would present it to you folks and say, this is what we are proposing to do.

This is going to require probably a minimum of

four meetings to get through this information, to get all the information from you folks and process and make sure that we do the right thing. I just want to be clear with that up front. This is not an easy project. This is very complicated.

Hopefully, I haven't left anything out. What I would like to do at this point is I would like to allow the environmental agencies a minute to present what the two different options mean in terms of fish and environmentally what the two different options would present. So who would like to go first? Wende.

MS. MAHANEY: I will go first. Good evening, everyone. Again, my name is Wende Mahaney and I'm a wildlife biologist with the U.S. Fish & Wildlife Service in Orono. We are a federal agency, not a state agency. We don't have any regulatory or decision-making role in this project or any other project like this, but where we do fit in, as DOT has already mentioned, this project, because it's working in a river and an associated wetland, needs a permit from the U.S. Army Corps of Engineers, which is a federal agency. They, by law, have to coordinate with federal and state resource agencies to get input. So we will be involved with DOT and the Corps of Engineers all through the planning of this process.

We will be reviewing information that DOT is gathering, and we will be making recommendations to DOT and the Corps of Engineers, but again we have no decision-making role in this process.

The Fish & Wildlife Service has mandated trust responsibilities from Congress and those are migratory birds, so things like waterfowl and nesting seabirds and shore birds and migratory song birds, that's a big one. Certain species of fish, primarily those that live part of their life in both freshwater and marine environments. DOT has already alluded to Atlantic salmon.

Our other major trust responsibility is species that are listed under the Federal Endangered Species Act, and I'm sure it's no secret to any of you that Atlantic salmon are present in the Machias River. So that's one of the species that will certainly be an element in this project. I don't think it will be a driving force or a major element of any major decision that's made, but it will certainly be part of the review process. And there is going to be a process that the Corps of Engineers and DOT have to go through as part of their federal permitting. And we will be right there along with the National Marine Fisheries Service.

So that's kind of a description of our role. This project is new for us. I know some of you are very familiar with the similar situation in Addison where the Fish & Wildlife Service and a lot of the natural resource agencies have been looking at that project with an interest towards restoring saltwater in that area and there has been studies done and we know quite a bit about that situation. We know about the fish and wildlife that are living in the marsh right now and in the river. And we have some pretty good idea about what would happen if tidal flow were to be restored.

We don't have that here because this is a new project for all of us. We have some guesses, but I think it would be premature for any of us to stand up here and tell you exactly what we think would happen if a bridge span were put in there. That's something that we will be working on with DOT in the coming months and years to try to figure out, but I think I would also be disingenuous if I didn't tell you that my agency has an interest in seeing tidal flow restored in here. That's probably no secret to you. For two primary reasons, one to restore access to indigenous fish species and to restore that as a saltwater marsh for primarily, probably, for winter

and waterfowl and migratory song birds.

But, again, no decisions have been made. We need to look at the marsh. We need to look at what's there right now and get more information about what would happen if DOT were to choose a bridge, but no decisions have been made. But, again, it would be disingenuous for me not to say that we have an interest and we will be talking to all the agencies about that as the process goes along.

And I think that's about it. I will be around for questions, if folks have them.

MR. ANDERSON: All right. Trent, do you want to --

MR. LIEBICH: I'm Trent Liebich. I'm with the National Marine Fishery Service. Wende summed everything up pretty well. Basically, her counterpart, there is the Fish & Wildlife Service and then the National Marine Fisheries Service. We do the same type of consultation. Our involvement with this project would be through Section 7 of the Endangered Species Act, to try to minimize impacts of natural resources, especially in the fisheries side of things. Being the National Marine Fisheries Service we're really interested in Atlantic salmon and short-nosed sturgeon out of our office. That's the office up in

Orono, Maine.

This project, as Wende mentioned, is really going to be Atlantic salmon. I don't think -- there is not really a lot of evidence or data supporting that there are short-nosed sturgeon present here. There probably are, but they're not on the Endangered Species Act, at least not up in this area of Machias right now.

So really we'll be focused on Atlantic salmon. Atlantic salmon are in the Machias River. The Middle River isn't one of the rivers that's really high on the list for Atlantic salmon, so it's probably not going to be a big concern.

As Wende also mentioned, it's probably no secret the National Marine Fisheries Service is also interested in fisheries and ecosystems and, you know, ecosystem restoration so being a salt marsh it's something that we would definitely be interested in, understanding the benefits to restoring tidal flow in this area. And also, as Wende mentioned, we're not -- you know, we don't have a decision made one way or another. It's really a new project. I'm here tonight much like all of you, trying to understand some of the details of this project and timelines and what it would mean to the -- to Machias and to the fisheries in this area.

So that's about it. And I will also be here tonight if people have questions and wanted to talk to me afterwards.

MR. ANDERSON: Ernie.

MR. ATKINSON: I'm Ernie Atkinson. I work for the Department of Marine Resources, Bureau of Sea-run Fisheries & Habitat. And I work out of the field office in Jonesboro in direct research and management that's primarily focused on restoring Atlantic salmon in the Down East region, but we also are responsible for other indigenous species such as alewife, Lubec herring, tommy cod, smelt, etc.

I'm not going to repeat what Wende and Trent have said. The same stands. We are here as an advisory capacity.

I do have a prepared statement from my director, Pat Kelleher, and I will go ahead and read that so that there is no secret as to our position either.

Dear Mr. Anderson, this is directed to Devin. The Department of Marine Resources is supporting the proposal to replace the existing Dyke Bridges, here both the west branch of the Pleasant River and here in Machias. And our position is to -- well, I'm kind of paraphrasing a little bit. Let's see here. Removal -- our position is that the removal of the tide gates

would have many ecological benefits, including improvement of wildlife and fish habits. Increasing river connectivity is important to many indigenous fish species and restoring the ecosystem functionality.

From a Marine Fisheries perspective, removal of the tide gates would help to improve or restore several indigenous fish species, among these are alewives, Lubec herring, tommy cod, Sea-Run brook trout, rainbow smelt, and American eel.

Restoration of these fish species would have the additional benefit for federally listed populations of Atlantic salmon by providing both a fray buffer and a food source.

Additionally, alewives are currently a commercially harvestable species. Removal of the tide gate potentially could restore alewives and rainbow smelt population to the Middle River, as well as the west branch of the Pleasant River that could be harvested at a future date.

For these reasons, we fully support replacing the existing tidal structure with a bridge. We appreciate this opportunity to work with Maine DOT as these projects progress.

And having said that, I will also be here to

answer questions. Thank you.

MR. ANDERSON: Thank you, Ernie.

Is it Tom Schaeffer?

MR. SCHAEFFER: Yes, sir.

MR. ANDERSON: Tom, thank you.

MR. SCHAEFFER: You're welcome. My name's Tom Schaeffer. I'm a regional wildlife biologist from the Maine Fish & Wildlife Department. I'm Wende's counterpart on the state level.

Rich Bard is also here. He also works out of the same office as I do in Jonesboro. We pretty much act similarly to the -- as the U.S. Fish & Wildlife Service on the state level, therefore our interests are very much the conservation and protection, enhancement of wildlife and fishery resources in the state of Maine.

Our fisheries division is not represented here tonight. As I said, Rich and I deal with it on the wildlife end. It's important to note, like all the other agencies that you have heard from so far, that we are -- we also are not a regulatory agency. We're not in the process or in -- we don't issue permits. We review and make recommendations to other regulatory agencies. On the state level, a regulatory agency in this case that we probably would be making

recommendations to in addition to the Department of Transportation would be the Maine Department of Environmental Protection, so there will be permits, I am sure that will be issued, and impacts assessed based on environmental assessments that we will be doing.

So we are very much here to listen and learn, as has been stated, the project is new. So we have no foregone conclusions. As a general rule, the Maine Fish & Wildlife Department also supports in general, you know, the restoration of saltwater flows and perpetuation of intertidal habits. They're high energy, highly productive ecosystems that support a lot of Maine wildlife species so -- as a general rule, but we have not reached any conclusions. We're learning as much as you are.

So if there are any questions, I will be available as well. Thank you.

MR. ANDERSON: Thank you, Tom.

Judy Gates.

MS. GATES: I'm Judy Gates. I'm the director of Maine DOT's environmental office. And I thought I would step in for just a second because unfortunately we don't have anybody here from the two decision-makers in this project for our permits, which is Army

Corps of Engineers on the federal side and the Department of Environmental Protection the state side.

The state agencies that you heard from, DMR, Inland Fisheries & Wildlife comment to DEP. The other federal agencies comment to the Army Corps. And then those representatives make the decision based on the regulations and making sure that we have met all of the standards. So we will make additional efforts to get those people to future meetings to talk about the licensing requirements. If you want, in the meantime, if those kind of questions come up, I'm happy to answer them and am very familiar, so we can do that, but I just thought I would apologize for their absence basically.

MR. ANDERSON: Thank you.

With that I'm just going to restate the -- I know you folks are going to have a lot of questions. We will try to answer what we can. But what's most important here is that you get your questions, comments, and concerns out so that they're on the record, so that we can look at them and make sure that everything is looked at as we go through this process. So what I'm going to ask, as we open this meeting up for questions, comments, concerns, etc., is that you state your name and who you represent for the court

reporter, ask your question or whatever. We will do our best to answer them. And then we are going to try to move on fairly quickly so that we can get everybody's stuff on the record.

I believe to start out with we have a lady that would like to give you some history about this bridge site.

MS. ATWOOD: I'm Valdine Atwood. I'm a local historian and genealogist. And I put together the history of the Dyke, which goes back a lot further than what you mentioned. And I've -- this research was done by myself and by Judge Lyman Holmes.

The historic perspective of the Middle River Dyke, the need for a shorter way to travel from Machias to points east has always been on the minds of Machias residents. Travelers had to go by the road up around the settlement of Marshfield, some five miles instead of being able to cross the several hundred yards across the river. First mention of constructing a dyke on the Middle River appears in the Machias town records in 1832. A map of 1835 shows a toll bridge privately owned by the proprietors of the Machias bridge which was incorporated February 5, 1822, by an act of the Maine State Legislature.

On several occasions, articles are published in

the Machias Union and by the act of the Maine State Legislature. It was noted that the toll bridge had not been properly maintained. So in March of 1845, the Town of Machias was empowered to purchase the bridge from the proprietors of the Machias bridge. A July 1865 article in the Machias Union stated that the old toll bridge is up for repairs. Travel goes via Marshfield or Machiasport. When the bridge is completed, notice will be given. So it appears that even after the Town acquired the toll bridge, there continued to be problems with the upkeep. In February of 1866, the State Legislature approved and gave authority to the Town of Machias to erect a dyke across the Middle River.

In August of 1866, William Longfellow, a local contractor, whose ancestors herald back to the early settlers of Machias, including Morris O'Brien, Job & Mary Burnham, and through his grandparents, both of the Nathaniel Longfellows who had fought in the Revolutionary War. And he offered to build a dyke across the Middle River for $15,000. Longfellow traveled to Nova Scotia to investigate the expenses of building and the material used in construction. Longfellow built a railroad, wood with iron rails stating -- starting at the ground near the westerly

end of the old toll bridge to the eastern shore. A car was used carrying dirt, stone, etc., and little by little, shovel full by shovel full, for days and weeks until the old thoroughfare of the tide was closed. Problems had been encountered, but in the end it withstood heavy winds and high tide. And finally, a July 1868 issue of the Machias Union it was reported that The Great Dyke is completed.

The Middle River was fed from springs, small ponds, and lakes and reaches from Northfield to the Machias River, forming a junction at the toll bridge. Above the tidewaters, there was a sawmill and a grist mill, and other machinery. When the tide was in, the waters covered an area not less than 4 to 500 acres. Following the channel from the dyke to the head of the tidewater were judged to be the distance of about 2 miles, besides there being numerous arms and inlets on either side of the main channel of considerable size. The Machias Union reported on August 18, 1868, I quote, last Friday was one the busiest days ever known on those celebrated dykes. Standing on the bluffs overlooking the large territory one could see 40 or 50 crews of men cutting the largest, most valuable crop of hay ever grown there, estimated at about three tons per acre. The crop was heavy and the quality

superior, the last and perhaps attributed to the big dyke, which was so securely -- which has so securely shut out the saltwater for the last six months.

There were side advantages to the dyke. In December of 1868 issue of the Machias Union, it was reported that lively times were had on the skating rink above the big dyke. A March 1877 issue of the Machias Union reported that Dyke Park is open to the public and the remnants of Dyke Park are still visible. The track was finished and persons and parties driving for pleasure are invited to use the course. No toll or tariff are present, so that trotting speed can be tested and the horses initiated to Dyke Park. Again, in June of 1877, the Machias Union stated that parties driving for pleasure are invited to the course.

The famous Saxby Gale of October 4, 1869, did some damage to the dyke, but Longfellow had a large force of men on the dyke the next morning making repairs. A Sackville, N.B. report on October 7 stated that the tremendous gale had produced the highest tides ever known. The historic Saxby Gale was one of the must destructive storms in the recorded memory.

In the 1890's the dyke was enlarged to make way for the Washington County Railroad. Work began on the

Trestle Dyke in October of 1865. Difficulties were encountered during the process, but finally the first passenger coach finally entered Machias on October 6, 1868.

Over the years, repairs have been made to the Great Middle River Dyke. It is in need of repairs once again. We believe that this structure that has served the people of this part of Maine for well over a 144 years should be repaired in the manner of the construction back in 1866, a dyke with a clapper so that the large area above the dyke to Route 192 be allowed to remain free of saltwater, and so that the wildlife and the landowners can continue to use the land as it has been for these many years.

And as I say, this was prepared by myself and by Judge Lyman Holmes.

MR. ANDERSON: Thank you.

With that the meeting is open for questions.

MR. MCFADDEN: Yes, I'm state representative Howard McFadden and I have -- Marshfield is part of my district. And I just heard mention something about a bridge and bridge would have a devastating effect on the property owners because of flooding of the farmlands or where they hay, the septic systems, the drilled wells, and so forth and so on. So I think we

need to look at it very carefully. I know nothing's in concrete at this moment, but we need to watch the bridge because of the property owners in Marshfield. And we have a Machias representative right here so I'm sure he can speak to that.

MR. ANDERSON: Thank you, sir.

Yes, sir.

MR. RAYMOND: My name's Jim Raymond. I've been a resident here for 25 years. I retired 2 years ago. When I moved here 25 years ago, I was very involved with town stuff. I was going to all the selectmen's meetings, yada, yada, yada. And the selectmen not only now but the old ones that have come and gone have always argued about water and sewer across the dyke, regardless of whether we do it or not, can we at least put the pipes in and whichever option you choose can we at least put the pipes in and just cap them off?

MR. ANDERSON: Yeah, the Maine Department of Transportation would be more than willing to -- to work with the Town so that the Town can incorporate what they would like --

MR. RAYMOND: Even if they don't use it, just put them in there.

MR. ANDERSON: That's right. It would -- I mean, it would be at the Town's cost, but, yes, we would

definitely -- would definitely be willing to work with the Town to put that across the bridge.

Yes, sir.

MR. COSTA: My name is Robert Costa and I've worked as a fishery biologist for the U.S. Army Corps of Engineers and I actually came up to Maine to raise salmon. And I think one of the untold stories here is jobs. How many jobs are going to be created? Of course, I can't help but agree with the fisheries biologist environmentalists that have spoken tonight about the benefit to the fisheries, the nurseries, and the salt marsh, and so on and so forth, but that translates to jobs. It translates to jobs in Machiasport and down the Machias River and out into the ocean where you have, first of all, in the rivers, estuaries, you have clammers. And you have fishermen out in the ocean.

And how that translates to jobs is that specifically functioning as a nursery, this -- the salt marsh provides a habitat, a place for young fisheries to reside. In addition, the salt marsh provides vegetation. That vegetation is consumed by the tiniest of organisms that are eaten by the largest of organisms and finally caught by us, the biggest or the organisms at the top of the food chain.

So I think that in part of your analysis of the bridge proposal that in order to support your benefit cost ratio, you should take into consideration how many jobs are going to be created by enhancing the fisheries.

And also you might want to look at tourists coming to Maine, the benefit to the restaurants, hotels. And also possibly increased property values because the properties along the Middle River will now be prime shore front property and --

(The audience all started conversing.)

MR. COSTA: Not too many realtors in the audience it sounds like. Thank you.

MR. ANDERSON: Yes, thank you.

Go ahead, sir.

MR. PELLON: My name is Edward Pellon. I live in Machias and have been here since I don't know, how long, Esther, about 47 years. I first want to disagree about the value of the land. I'm here representing Medovie High, Inc., and one of the other partners is here in the crowd. We own a substantial piece of land along Middle River, which you will flood. And if you don't think it won't be a mess, we also, she and I own the land over Route 1, which now when you put the trail in and you let them come

through -- it used to be a beautiful looking marshland out behind our building, which is beyond the medical center and Dr. Sparaga's, ma'am, go look at it now and see what -- you ought to go, if you're an environmentalist, and look at the mess over there.

As far as creating jobs, when was the last time the Atlantic salmon was up in Middle River in 100 -- I have the same paperwork you have -- in 140 some odd years.

I think that the wildlife industry -- I am not a fisherman, I don't even own a rod -- is flourished in this area -- I am a contractor. I am a builder. I will tell you what it's going to do to the land that we own 150 some odd where is she -- this lady will tell you too, about 150 some odd acres up there along Middle River and what you're going to do to us -- you'll still expect us to pay the taxes even though you've ruined the appearance of it. Again, go look at what you have done over on Route 1 by the trail.

You graze cattle up there. Dick Albee until he passed away, had many cattle. I believe sheep are grazing there. And I don't know, as I say, how many fish have gone up in there. Maybe we ought to look to see if there's any frogs up there, we don't want to kill those. I think they belong, to live there in the

freshwater.

I think you need to leave it with the clappers and I disagree that it's not historical. And there is a historical lady sitting there that gave you the report. I think she agrees it's probably historical. I have the same report that I was given by some people from the state or the Department of Marine Resources or whatever you call it. And they don't agree with opening the bridge either, but they can't speak out here.

But I don't want you taking and ruining the property on both sides of that river. I believe the Spragues can speak for it and many more. It might be easier to build the other bridge, but historically it should stay the way it is and not take our property, nor ruin our property. And, again, the wildlife industry had flourished. I don't know how many other types of fish that you will see up there. You don't know if it's even in this area and the Atlantic salmon have never been there for 140 some years. And you haven't gotten the Atlantic salmon that you had when you had to dip them up over the dam that you took out here in the Machias River.

So leave -- build it. It needs to be built, but build it with the clappers.

UNIDENTIFIED SPEAKER: If it works, don't fix it.

MR. ANDERSON: Thank you.

Yes, representative.

MR. BURNS: Thank you. I'm Dave Burns. I am not a biologist, but I do represent the folks of Machias. I couldn't agree with Ed more, what he just said. I think it's extremely important for us to consider the fact that if we do put a bridge in there, we're going to be taking property away from people that have had it for generations.

But the other thing that we have been talking about is the wildlife. I think the biologists ought to consider the impact to the wildlife that's been there for the last 144 years. It's also very important to us in this area. So I think that's a critical thing you want to take into consideration.

MR. ANDERSON: Thank you.

Yes, ma'am.

MS. BROWN: I don't really want to --

MR. ANDERSON: Could I get your name?

MS. BROWN: Virginia Brown, Machias.

MR. ANDERSON: Thank you.

MS. BROWN: I don't want to read the whole list here of various species, but we wrote down all of the animals and the birds and some of the insects that we

have already seen on this side of the river. And so I'm just going to give you the list.

MR. ANDERSON: That will be fine.

MS. BROWN: But I would like to say two other things and one is agreeing with Ed, is that the salmon haven't been there for 144 years. None of us have ever seen it. And I doubt the salmon even have it in their genes anymore to go back up that river. So I don't think that should be an issue at all. And I do fish.

Also, there's an old dump there that you need to worry about because if you start to dig it up, it's going to start leaking, landfill.

MR. ANDERSON: Yes, sir.

MR. RAYE: Yes, I'm State Senator, Kevin Raye and I represent all of these effected communities. I had a question for Wende Mahaney. I was struck by something you said and I wrote it down. Because you said that you don't expect the salmon to be a driving force in any decision. And I wondered if you could clarify that because that's, I think, one of the grave concerns that many of us have here is that that concern would, in fact, become a driving decision that could color the outcome. So I was very interested in that comment and wondered if you could just clarify

that or expand on it.

MS. MAHANEY: Sure.

MR. RAYE: And then I have another question for Judy, which is, why is it that nobody is here from either the DEP or the Army Corps of Engineers? I'm disappointed in that.

MS. MAHANEY: I will go first. The Federal Endangered Species Act, for the most part, doesn't stop projects or decide how a project ends up. It gives a mandate to federal agencies, and federal agencies only, that a project that they fund, authorize, or carry out can't jeopardize the continued existence of listed species. That's lingo, but it basically means your project can't cause a species to be on the brink of extinction. And even if DOT were to decide to replace the dyke as it is now, with tide gates, I don't think we would reach -- I'm sure we would not reach a decision that doing so would cause Atlantic salmon to be on the brink of extinction.

UNIDENTIFIED SPEAKER: Right.

MS. MAHANEY: So the Endangered Species Act very rarely stops or changes a project in a major way. What the consultation process between -- it's probably going to between National Marine Fisheries Service because they usually do projects that are in the tidal

department, and the Corps of Engineers will do -- ensure whatever DOT does, whether it's replace the dyke with tide gates or replace it with a bridge, that the construction related impacts to salmon, if there are any, would be minimized.

So that's where our primary involvement is. We want to do what we can to make sure the project minimizes those impacts, but the Endangered Species Act isn't going to drive what DOT or the Corps of Engineers ultimately decides. Will it be a factor, sure. Will it be part of the environmental permitting process at both the federal and the state levels, sure. But I really would be surprise if it ends up being a major driving factor in any way.

MR. RAYE: I think that's one of the most encouraging things I could have heard it. I'm pleased to hear that.

UNIDENTIFIED SPEAKER: You've got about three reporters I hope are listening.

MS. MAHANEY: Let me just add one more thing, but on the other hand, you know, again, what I expect the Fish & Wildlife Service and National Fisheries Service will -- we're interested in seeing tidal flow restored there. Again, no decisions have been made. But it -- in a big picture way, we think restoring tidal flow to

the Middle River in a big picture way will help make the Machias River a healthier system, which will help salmon. I don't think that's any secret to anybody. So people will probably hear something to that effect, read something to that effect as this process goes along. But, no, we don't expect thousands of salmon to start swimming up the Middle River if DOT were to replace it with a bridge. So it will be part of the review process.

MS. GATES: And where it comes in for DOT a lot of times in construction, it's construction timing, construction restrictions, construction techniques that have to be used when certain species are present. So for us that's usually the largest concern when we deal with endangered species.

Army Corps of Engineers, we're not sure why they're not here. We thought Jay Clement was coming, but obviously he couldn't make it. He does live down south of Portland.

And the other representative from this area happens to be Wende's spouse and somebody had to stay home with their daughter. So, you know, it's a night meeting. From DEP, it was too short of a notice for them. They couldn't get anybody here. They all have small children. You all know what it takes to get out

on a week night. I understand, but that was -- we tried. We did try and we will try again in the future.

MR. ANDERSON: Just to clarify, folks, again, this is one of several meetings.

MS. GATES: Right.

MR. ANDERSON: This meeting -- the most important thing from this meeting is to get all of your questions, comments, concerns on the record and maybe when we come back at the next meeting, those folks will have had a chance to see those and they will be here to help answer those questions.

MS. GATES: They're not avoiding the meeting by any means.

MR. ANDERSON: Yes, sir.

MR. CHERRY: Yes, my name is Bill Cherry, and I live here in Machias. And I'm the president of the ATV and Snowmobile Club and we have a major trail that comes in the back behind the Dunkin' Donuts building down there. And with the flooding of that marshland out in there, we would lose access to get across that low area.

The present -- the landowner here, Chris Sprague, has put that as a designated trail for us to use and we would be able to -- not be able to use that if it

were to flood like that.

And then the second part of -- that I would like to mention is that I am a real proponent for economic improvement in Washington County and I put together some numbers and I think I can remember them. And if we were to flood the former Mac McKenzie complex down at Dunkin' Donuts, we would lose the septic system and would lose the well in there, so the likelihood of losing that business would have a significant impact on the area.

I can direct this mostly to our representatives and that is that if -- I talked with the owner of the building and he said that the average employee down there the number is around 50. And if they earned $15,000 a year working there, I do have to refer to this, that would come to a payroll of about $750,000 a year. And then you take the factor of multiplying that times 7, that a dollar circulates in the community before it goes out and goes to Wally World or Home Depot, that would have an economic impact of $5,250,000 on our area. So please take those things into consideration. And I'm talking on behalf of the people of Washington County when I say that. Thank you.

MR. ANDERSON: Thank you.

Sir.

MR. MCEACHARN: Yes, my is Dana McEacharn. I'm from Machias. A friend mentioned something that -- at the risk of being inflammatory, I will tell you what my friend spoke about. It was mentioned that if a tidal area was -- if a salt marsh was allowed to re-establish itself in Washington County, that locations in western Maine would be leveraged into a situation where they would be able to develop an area that might be nearer salt marshes or something. And I was just curious about who might be able to respond to that in any way because it is going to come up as a topic and I just thought I would jump right in there and broach it.

MR. ANDERSON: Well, I think that Judy might be able to help a little bit.

MS. GATES: I can do that. What you're talking about is mitigation banking.

MR. MCEACHARN: Yes.

MS. GATES: Or the process of impacting wetlands and compensating with restoring or creating or enhancing or protecting wetlands somewhere else. The recent -- there's been a recent federal rule change that prioritizes mitigation projects based on their value in the ecosystem or in an area, rather than

putting them necessarily right next to, for instance, a large strip of asphalt. You know, they look kind of landscape wise.

The state is following along with that. DOT has to put itself in a position to be able to comply with that, so we're in the process of applying for a federal mitigation bank that will cover the state, but that doesn't mean that by restoring salt marsh in Machias we will be able to expand the airport in Portland. It's all based on biophysical region. So it's -- whatever contributes to your area, that's where -- if there is a project in that area, that's where the mitigation has to be. So it is -- even though -- it's kind of a longer view of things. It let's you go ahead and take advantage of opportunities for mitigation when you can, put them in the bank just like your savings account, and take them out as you need them when you impact a project. It has no more cost benefit than if you wait until you do a project to get a mitigation. It's just that for the resource agency it's sitting out there already protected so for them it's in the bank. That's why it's called a bank.

We don't know what's going to happen behind the dyke if it's turned into a bridge. I mean, we don't know the extent of the flooding. We haven't done the

hydrological studies. We haven't looked at the ground water yet. There is a lot we don't know. So we don't even know what the restoration potential is here really. And we have made -- we don't even have a federal bank to put it in, for one thing. And that is not the goal of a project, not to create a mitigation project. The purpose and need of this is a transportation project.

JOHN SPRAGUE: May I ask her a question?

MS. GATES: Sure.

JOHN SPRAGUE: To put this in laymen's terms so I that I understand it --

MR. ANDERSON: Could I get your name first? I'm sorry.

JOHN SPRAGUE: My name is John Sprague. I live at 301 Ridge Road, Marshfield, Maine 04654. And I would like a copy, if I could, of these minutes, if that's possible. And later on I want to say some things.

But does this mean simply that if you flood this area and you create a wetland that then you can put that in the bank and what you can do is destroy a wetland somewhere else? Now basically that's what you're saying.

MS. GATES: What I'm saying is that the way that

mitigation works is you have to replace what you impact. Right. And first you have to avoid and minimize, then you have to replace, if you impact wetland. That's the way the rules work. We do that on DOT property. Okay. We have to control the property to do that. That -- that is the way the federal and state --

JOHN SPRAGUE: What you're saying so that I understand it --

MS. GATES: Yeah.

JOHN SPRAGUE: -- is that if you create a wetland here, you could destroy one somewhere else?

MS. GATES: You know, I hear it represented like that a lot and I'm not trying to dodge, but it's not --

JOHN SPRAGUE: But, see, I don't understand your talk.

MS. GATES: Okay.

JOHN SPRAGUE: I mean, I'm not trying to give you a hard time.

MS. GATES: No, I understand. By having things in a mitigation bank, it doesn't automatically let you go impact the same amount somewhere else. It doesn't work that way. There's -- we've had -- as an example, we have had a state mitigation bank for almost 10

years. We have never used one credit out of that bank because we have avoided, minimized, or done on-site compensation for every project that we've needed to. There is a federal law called No Net Loss that says if you impact a wetland, you have to put one back. It doesn't mean you have to put one back no matter what here. It means the agencies look at the options and see what the best fit is. You have to match -- you know, if it's habitat over here, it has to be the same kind of habitat over here.

So, yes, banking puts mitigation aside, if you ever need it. We've never needed state mitigation. I don't know how much federal mitigation we need. And there's been no decision made as far as Machias or Addison or any other project, except Sears Island, which I won't get into here, but that's the only thing, to put in a federal mitigation bank.

JOHN SPRAGUE: But that does exist that if you --

MS. GATES: Yes.

JOHN SPRAGUE: Okay.

UNIDENTIFIED SPEAKER: The avenue is there.

MS. GATES: The federal laws allow that, yes.

MR. ANDERSON: Yes, ma'am.

MS. FITZGERALD: Okay. My name is Betsy Fitzgerald and I'm the Town Manager in Machias, and I

have two things for you. The first is from the Machias Board of Selectmen and I will just read part of it. The Board met on December 9 of 2009 and discussed the Dyke Bridge as an item on their regular agenda. The Board does want to go on record and opposing the elimination of the gates under the Dyke Bridge across the Middle River.

And I will give you the rest of the letter.

The second thing is that I noticed in your announcement that you wanted references, if there were any, to a comprehensive plan. Machias's plan was approved on September 26 of 2007. And it is referenced five different times in the plan, and I have provided you with the references for your records. So if you don't mind, I will hop it up there to you. Snowboarding.

MR. ANDERSON: Already?

MS. FITZGERALD: Sure. Thank you.

MR. ANDERSON: Thank you.

In the back, sir, yes.

MR. GETCHELL: My name is Walter Getchell. I live in Marshfield. And I'm kind of torn here because I had some property that abuts the river and I stand to make a lot of money here, I guess.

On the other hand, I helped hay the dyke this

year. Because of my advanced age, I only drive the truck. I don't throw bales. And we got almost 300 bales from the dyke this year. And as for me, I think I would rather continue to hay.

MR. ANDERSON: Thank you, sir.

Yes, ma'am.

MS. SHANNON: I'm Kathleen Shannon from the Machias Bay Area Chamber of Commerce. I want to talk a little bit about the tourism that was mentioned before. I don't believe having that area flooded and then possibly becoming mud flats would make sense for tourists who want to be able to drive by that and see.

We also represent businesses in this town and surrounding areas. There are a number of businesses that are very close to that area that are food businesses. If we -- if that area gets flooded, there stands a very good chance of there being an unpleasant smell, Helen's Restaurant, Quiznos, Dunkin' Donuts --

UNIDENTIFIED SPEAKER: Subway.

MS. SHANNON: -- Subway would all be affected by that. So that's something that I think you should be considering, as well.

MR. RAYMOND: Comes pretty close to sea salt plant too, doesn't it?

MR. ANDERSON: Thank you.

Yes, sir.

MR. BROWN: I'm David Brown. I'm a resident of Machias. I'm heartened to hear that you're looking to keep the same footprint on the dyke. My concerns are mostly with the other wildlife that occupies the area, namely us.

I have lived in cities and towns all over the United States. One thing they all had in common was each of them had a social nexus that the community relied upon for social interaction, some were called the stretch or the walk or the promenade, a place where people gravitate to, a common ground to meet or make new friends, watch the world pass by or simply to create the illusion that they were still in touch with this increasingly distant world. The equivalent here in Machias is the dyke. You couldn't enter one of those communities and tell the inhabitants that the block would be hence forth located two blocks west of its present location. You could do it, but it wouldn't be reasonable to expect that society would simply embrace the new venue and continue as before.

The dyke not only provides social benefits, but it has the added benefit to the residents that it's a convenient place to pull off and have a lunch and enjoy the scene.

The dyke has also become an important financial component of the town. As a convenient common ground, it's become a relied upon asset for vendors, crafters, farmers, and fishermen and many others who make or supplement an income, flowers, vegetables, seafood, birdhouses, and potatoes from far off Aroostook. They're all hawked and peddled through the climate season. It's a chance for the average person to deal directly with vendors, who in all probability will never have a brick and mortar store. It doesn't diminish the value of their goods, but rather provides more opportunities for selling and buying local goods.

If you haven't been here long enough to notice, I can tell you that this is an area that cannot afford any interruption in the trickle of the money stream.

So I would like to see those considerations taken into account so they don't get bumped out or have to move away from the area.

MR. ANDERSON: Thank you.

Yes, sir.

MR. LANGLEY: My name's Jason Langley. I'm a resident of Machias. I'm with Sunrise Environmental. I have three questions. The first is, are you going to incorporate climate change effects, like sea level rise, in any of the proposed designs and also how

that's going to affect the amount of land that will be flooded in the future because your bridge design, I am assuming is -- you've engineered these things for 50 years?

The second question is, the town water treatment plant discharges into the Middle River during high rainfall events. We just had one not too long ago and opening up to full tidal influence, I would think that there -- after so many of these discharge events that have happened over time that there is some residual material on the bottom of the Middle River that could get mobilized from tidal flushing. It's not something that, I don't think, the Atlantic salmon would appreciate.

And my third question is, with regards to the trail, I seem to remember that the DOT had rail bank, which means that if rail -- railroad was going to be a viable thing in the future that the trail could be converted back to railroad use. And for this proposed project, are you considering to maintain that only as a trail or are you going to incorporate the rail banking aspect?

MR. ANDERSON: Well, I think I can answer your last question.

MS. FITZGERALD: Devin, can I clarify something?

MR. ANDERSON: Certainly.

MS. FITZGERALD: I don't mean to interrupt, but the Machias waste water treatment plant outfall pipe is not in the Middle River.

MR. LANGLEY: It's not?

MS. FITZGERALD: It is not.

MR. LANGLEY: Okay. It goes into the Machias River?

MS. FITZGERALD: Yes, it does.

MR. ANDERSON: That takes care of your second question.

In regards to the question about the railroad, any time -- any time that we have a rail bed, they always write the wording in such that if it becomes viable in the future, it could revert back to rail. If the State owns it, that's the way we write it because that's transportation of goods and materials and that's what our business is.

So in terms of the bridge, I don't believe we have any intentions of building the new bridge such that it would be carrying a railroad across it. If at any time that became something that would happen, it would need to be modified to accommodate that. We are not going to do that at this time. It's going to be built to handle cars, ATV, pedestrians, and so forth.

And, Mike, I will give you the first question.

MR. WIGHT: As far as taking into account climate change, that's one of the factors we will consider. I know there's been a lot of talk in the news the water may not rise at all or it may rise, you know, 6 feet in the next century. It is actually a real issue. We have about 100 years of tidal information. And along the coast of Maine, the sea level has risen about 9 inches. I mean, that's hard data. We will take into account, you know, how much. I don't know, but it is considered.

MR. LANGLEY: To see how much exactly it's going to go for a certain span of time.

MR. WIGHT: We will consider it.

MR. WIGHT: Thanks.

MR. ANDERSON: Yes, sir.

MR. GAY: I'm Steve Gay from East Machias. I own about 25 acres of land that is farmed by my son-in-law, which is low land, which definitely would be flooded. Presently we got about 12 to 1400 bales of marsh hay off that which goes to blueberry growers. And we would not only lose that, but we would also lose the value of our land, which would impact the taxation picture in Marshfield, so I am definitely not in favor.

MR. ANDERSON: Thank you.

Chris.

CHRIS SPRAGUE: Chris Sprague representing the union people. I live in Marshfield. One thing they talk about opening up the dyke like it's a light switch. 150 years and it will automatically revert back to what it used to be. And to me too much time has gone by. Right now there is an existing ecosystem that has been in place for approximately 150 years.

Mud flats from long ago have turned into topsoil and vegetation. Trees have now grown down to the river's edge. Many species of wildlife have now made this rich habitat their home. Why does this ecosystem not take precedence over the one -- over one that does not exist now and still only in theory might after a long period of time?

And also one thing, if the dyke is open, all of the vegetation, grass, alders and trees, etc. in the floodplain will decay, rot, and smell. This will not be an immediate transaction back to mud flats as we can see this behind the Shoppe Farm. It has been two years since the fields there have been flooding with the tides and much of that grass area is still in a state of decay. How is this rotting vegetation beneficial to the watershed?

And I also note here and wrote in here quotations, should we start to dump our grass and clippings in the Machias River to prepare the fish for this increase and composting vegetation?

MR. ANDERSON: Okay. Yes.

JOHN SPRAGUE: I'm not going to stand up because they made these seats real small and I have got a bad back.

My name is John Sprague. I'm from Marshfield. I think the uniqueness of this system and the one in Addison should be enough to keep it. It's very unique.

I used to own quite a bit of land. I've given it to my son now. And I have been in the blueberry business. And this is the best blueberry hay that you can find. When you take it to your field, you don't take a lot of seeds. It's also good cattle hay. Cows will eat it. Horses will not.

But you take the potential of hay all along there, there is much of that that isn't harvested that could be.

This is farmland. I have been farming it for years.

Also for historical values, there is a racetrack on there. You can see it on that one. It probably is

one of the oldest racetracks in New England. I can remember as a child going there and there would be a circus or something. I can remember there was a horse barn. They raised horses.

When the clapper system works right, that's a beautiful area. We used to have a baseball diamond down there, but because the clapper system isn't working right, it flooded it out. On the very low edge where the water is, you can hay that now. And there's tons of hay there.

We used to run very heavy tractors within 3 feet of that water and it was nice and solid. Because the clappers are not working right, that can't be hayed there right now.

I notice all the agencies -- my son kind of alluded to this, I wish there was an agency to represent the human species. And I mean that seriously. I don't want to get into the abortion issue, but we are killing off our young people, that's something else. Who is going to represent the human? Who is going to represent us and our land and so forth?

I do want to say this, back years ago the R.H. Foster place caught on fire, over in this area here, and it would be a little further. It's just off the

map, but when that caught on fire, there were tanks blowing up, boom, boom, and it was cold weather and the Middle River had frozen over. I live up in Marshfield and I could look down over the bay here and I counted 38 deer that ran across the river to get away from that noise. I don't know how many, but you will find the ecosystem and the animals that live there, that's quite a -- what's there now and I'm afraid that it might be destroyed.

I wasn't going to say this, but I am going to say this about the salmon, okay, because I run into this constantly. I'm a blueberry grower and we do some spraying and things and the salmon -- it's interesting to salmon, I do not know why the salmon are not coming back. Did the Russians deplete our salmon supply, I don't know. Did the milking of a salmon and putting the little ones -- I don't know what you called them, by putting them in other rivers did we destroy their genetic makeup so they don't know where to go, I don't know.

But it's interesting, when I was a child, I lived up on Dublin Hill and back then there were dams in the river and there were hydro plants and guess what, there were so many salmon you couldn't count them. I, as a kid, can remember taking a great big twig,

pushing them around in the river up there. They were waiting to go up the fish weigh. They went up by the thousands. Here's something else that was going on in the river, all the sewer from Whitneyville and Machias was in that river. By the way, we used to drink river water. This was our drinking supply.

If you check with people, and I was one of the people that helped clean this up, but years ago there was Fred Mooney's Motor. He sold Ford cars and there's a big brick building there somewhere right out back. It's right in that area somewhere. But the thing is this, when I moved home from Florida, I helped my father-in-law. He was contracted to do this, pull the thousands of oil filters out of the river that had been thrown in there. Evidently, they used to dump their oil in there.

Also this, Harvey Metty (phonetic) used to have a slaughter house on Dublin Hill and he raised animals and killed them. And I can remember swimming in the river and it amazed you what was floating down that river. All I'm saying is this -- all's I'm saying is this, by the way, I won't go into -- when Sewell, out of Old Town, put in the new sewer system what they saw in their cameras when they put in the new sewer system.

I don't know what destroyed the salmon, but to replace that clapper is not going to affect the salmon one bit. And I hope this, I hope that because of the uniqueness of what we have and what we enjoy, that they can fix it the way it is and we can enjoy it.

There used to be a man in the DOT -- his name was -- was it Norm Johnson? Johnson's name? Anyway, I can't think of his name, but I can remember we had problems with it. I used to get on the phone and say, can you come down and fix it? Yeah. They would be down and they fixed it.

I wish they do what they have to do to make it what it is. Thank you.

MR. ANDERSON: Thank you.

One of the things, and Mike alluded to this in his presentation, the reason that we are replacing the bridge is because the bridge is broken.

JOHN SPRAGUE: We know it's broken.

MR. ANDERSON: It can't be fixed by rehabilitation methodology. We actually tried down to Addison to fix that bridge by pumping grout underneath it because the water was flowing underneath the bottom of the boxes and pulling the fine material out, which causes the top to settle. You've got the same type of thing going on down here to the Machias dyke bridge.

The only way to fix it is to build a new structure in there. It's been there 80 years. It's beyond its expected life. We can rebuild it with a similar type system. And like I said, there's two options --

JOHN SPRAGUE: By the way, I'm Down East. When I say fix it, that's what I mean.

MR. ANDERSON: I know. I just want to -- I just want to make sure that it's clear to folks that the bridge is at the end of its useful life. We do need to replace it because we want you to be able to get from your home to your school and people in commerce to be able to get from here to there.

Go ahead, Judy.

MS. GATES: The comment about we wish there was somebody to represent the humans or the people, the part of DOT's mandate through, you know, to get its federal money, to be a responsible state agency is to consider the people. You know, that's a large part of why we're here to hear what we have to consider. And we do look at cultural, like the existing use of the causeway. We look at all of that.

And, you know, I'm sure at the end, everybody's not going to be happy and feel like we haven't taken good care of them no matter what the decision is, but

we are considering those.

CHRIS SPRAGUE: Make the locals happy, please.

JOHN SPRAGUE: My son would lose probably 80 percent of his land.

MS. GATES: No, I understand. I am just saying we do have to take that into consideration and we do our best to listen and incorporate all that into what we design.

MR. ANDERSON: And that's why it's so important for you folks to make sure that you folks voice your opinion here at this meeting and get it on the record.

Yes, sir.

MR. WHITMAN: My name's Bob Whitman. I'm a selectman from the Town of Marshfield. We have had to listen to everybody talk about the environmental aspect and fish and everything else, the people that are here from Marshfield, there is a lot of people here for Marshfield and a lot from Machias. Marshfield is going to be hit with the flood, to say the least, all our taxpayers. We are going to get the brunt of the whole bridge.

We would like to have the bridge back the way it is and have a new bridge. That's not a problem, but -- and this lady just brought up a point that it's the people that make the decision of what's going to

happen. You're protecting our rights. I would suggest that you take -- if the Town of Marshfield voted in our next election, in our next town meeting to say how the Town voted, whether they want the bridge as it is or change it to a brand new bridge. And the Town of Marshfield and Machias do the same thing. Put it on an article on a warrant and sit there, bring the Town's people in. How do you want it, do you want the old ballast type system or do you want a new bridge, you know, and let the people know, let them decide what they want.

And by doing that, you show your decision which way you got to go. They all want the bridge, no doubt. They all want the bridge or the dyke fixed, but they want it fixed the right way. You know, make it for the people.

MR. ANDERSON: Towns are more than welcome to gather information like that and pass it in to us. We will put it into our records and stuff.

Up front here.

MR. ROBBINS: Joe Robbins, East Machias. In 1960 I caught my first Atlantic salmon. It was in the Middle River. I was with Francis Reynolds and my brother. We were kids. And when I took them home to show my stepfather, he shamed me because they weren't

trout. They were Atlantic salmon.

Olive Getchell used to see adults in that river every year and she showed me where they spawn. So there have been some salmon there in the last 100 years. But the thing is back then the clapper gates were working. They were working good. And there were other sea-run fish in there. There were sea-run brook trout because we used to catch them, when the clappers were working, but there were salmon up there and there were always salmon up there, whether the gates were working or not.

MR. ANDERSON: And to add to what you're saying, we have done some investigation, as well. And there are clapper-style gates that are fish friendly to pass fish back and forth up through there. I mean, there is technology available to do that.

Yes, sir.

MR. ALBEE: Yeah, my name's Geary Albee. My wife and I live in Marshfield, and we own probably 75 acres that may be flooded if you don't put the clappers back in.

We raise perfect Angus cross beef, and my dad always raised beef down there on the dyke. And I have reference to an early Machias Union article in the paper and this is at the proprietary meeting July 22,

1773, voted that there be 16 shillings raised upon each right to pay for laying out the marsh lots and other incidental charges. This was signed by S. Jones.

We own one of them number 61 marsh lots in the town of Marshfield and about 75 other acres down there. And on that property, you can see the old drainage ditches. They're about 40 feet apart where labor was put in there down there to relieve some of the water. There is a lot of water, cold streams running off the side of Marshfield, running down through my pasture. There are numerous bait fish in there all summer long. There have been egrets, American bittern down there in the pasture with my cattle. Any of you are invited to walk down there and see the numerous ducks that are in them wet ditches that are wet all summer long.

There is, like I say, three at least, springs that come together down there on the property that run through that pasture. I would not like to see that flooded and lose that privilege.

It's been farmed for a long time in Machias Valley, that's why the settlers came here. I think my cattle are still down there. I would like to keep it that way. Thank you.

MR. ANDERSON: Thank you.

Yes, sir.

MR. HANSCOM: I'm Ivan Hanscom from Marshfield, next door neighbor to this fellow. I don't know as I want to admit it. But I'm also the second landowner on the trail that Mr. Cherry mentioned, to get the snowmobile trail up through there and that trail connects to numerous trails out there to go hundreds of miles. And to my understanding, he may be able to correct me, but I don't think there is another access point on the railroad going west until you get maybe to Columbia Falls.

MR. CHERRY: That's correct.

MR. HANSCOM: With a designated trail going the other way, I don't think there is another one until you get above East Machias; is that right, Bill?

MR. CHERRY: That's correct.

MR. HANSCOM: That's quite a span.

MR. CHERRY: Important trail.

MR. HANSCOM: That is one thing. I will try to be brief. But the other thing is if you look at your left-hand map down there, follow that river up to Route 192, I don't know if you have taken the elevations, but there's evidence of flooding up there. If you get a storm coming down Marsh Lake and several

lakes that are up there, and the high tide going at the same time, there is a possibility of that road being flooded.

MR. ANDERSON: There definitely is.

MR. HANSCOM: The other thing I would like to ask is, what is the economic difference of cost of one project, as opposed to the other? Thank you.

MR. ANDERSON: Well, we're not far enough along to give you a price difference between one option and the other, but as we progress, we will have more information.

MR. HANSCOM: Have you done any elevations on Route 192?

MR. WIGHT: Yes, we have. Just to get on the record, down on Route 1 in the vicinity of the dyke, between roughly elevation 11 and elevation 12 and they're about the same elevations up here on Route 192 where it crosses over Middle River between elevation 11 and 12.

MR. HANSCOM: In less than two weeks ago the water went over the dyke, this year.

MR. ANDERSON: Thank you, sir.

Go back.

MR. LANGLEY: I just have a quick suggestion. I was thinking maybe for the next meeting it would be

helpful to -- especially to the abutting property owners if you brought a map of where you think the projected high tidewater level lines would be in the scenario where you have complete tidal.

MR. ANDERSON: We are in the process of having aerial photography done. It won't be able to be done until after the snow comes off. So that information will be available at some point, but I am not sure whether it will be available at the next meeting or not.

MR. LANGLEY: So do you have a map there with elevations?

MR. ANDERSON: Well, we have a map here, but there are 20-foot contours and we need a lot better information than that to show where people's land would start being flooded or where -- what -- how the contours run around that wetland area.

Yes, sir.

MR. CHERRY: My name is Bill Cherry and I participated in and had a lot to do with the rail trail effort and I got direction from David Cole, who was the Commissioner of DOT. He says, Bill, you aren't going to get any place with that until you get your people behind you. And get your people behind you and your businesses and then take your select

persons in the towns and then go to your representatives and get your representatives' support and take that to the governor and then you will have the rail and trails conversion.

And my question would be to our representatives here tonight, if by majority you were hearing that the choice was or preferred choice was flappers to be re-installed, even if it did cost 25 percent more, would you have the influence to have those flappers installed if the people were wanting it?

MR. RAYE: I think the greatest fear that we have is that we don't really have a problem, I don't think, and I haven't thought throughout the process with the Department of Transportation. My greatest fear is the federal regulatory agencies over which we have no control. And that's why I keyed in on the discussion about the Atlantic salmon.

Everything that I have heard to date leads me to believe that there is very strong support for maintaining the type of structure that is there now and maintaining the ecological structure that is there now. I don't think that's the issue. I think the issue is about the regulatory process, the permitting, and particularly at the federal level.

MR. CHERRY: Then if it were overridden on the

state level, then we would have to see the federal level people demonstrate that we would -- like Susan Collins and Snowe and Michaud and one more there --

MS. FITZGERALD: Pingree.

MR. CHERRY: -- Pingree. And so maybe we would have to go even to that point?

MR. RAYE: Well, I think we need to see how it plays out, but that would be the logical extension.

MR. CHERRY: Because believe it or not, they are very available to you. By writing letters, you do get their attention. I have been there.

MR. ANDERSON: Go over to this side.

MS. COOK: Sharon Cook. I am co-owner with the Maine Sea Salt Company. And it's my understanding that you were saying that you didn't know high this could go. Well, the Margaretta was dismantled right by our house so that means that the river could be affecting our property, and the property of Mrs. Getchell next door would be flooded right over because the water was that high. So it is impacting a lot of people along that river.

MR. ANDERSON: Let's go back, yes, sir.

MR. RAYMOND: You say you've got a quarter of a million dollars to do this preliminary study?

MR. ANDERSON: Yes.

MR. RAYMOND: Well, if you just skipped over designing the bridge, you'd save a few bucks.

MR. ANDERSON: I could save a lot of money, but you would be very unhappy when you couldn't get from one side of the dyke to the other.

MR. RAYMOND: Just design the flappers. Period.

MR. ANDERSON: The bridge is further gone than just replacing the flappers at this point.

MR. RAYMOND: Well, don't design the bridge. Design new flappers. I mean, you missed what I am saying.

MR. ANDERSON: I understand what you're saying. At the Department of Transportation, we have a process that we have to follow to make sure that we get the right thing back in. And that's what this whole thing is about and gathering your information and stuff. So we have to do this. We have to make -- we have to make the other -- we have to make sure that the agencies have all the information and we go from there.

I'm going to the lady in back.

CAROL SPRAGUE: Yes, my name is Carol Sprague. I'm Chris's mom. And my question is, how old is the map on the left because I don't see Chris's house on that map?

MR. ANDERSON: It could be 20 years old.

CAROL SPRAGUE: Okay.

MR. ANDERSON: It's a photo taken from the air and the purpose of it is just to show the contours of how the wetland fits out there.

CAROL SPRAGUE: The other thing is, I'm Ralph McKenzie's daughter and I did inherit this land from my dad. It's been in the family for over 50 years, which is about half the time of the dyke.

I'm thinking of Chris as a mother. He has a beautiful home that my husband and my son built. We're do-it-yourselfers. We've worked very, very hard to maintain what property that we do have. We did give the land to our son. He has built a beautiful home. It took my son and my husband four years to build that home. They are now in the process of building a beautiful barn.

I have a beautiful granddaughter that's wonderful that has horses or has one horse, but there will be more. There is going to be eight stalls in that barn.

The racetrack is one of the oldest ones in the state of Maine. It was the best play track, I forget, this side of wherever. But we were in hopes to be able to use that track again as trails for riding and use it as a riding stable and whatever. I hate to see

my granddaughter denied her rights to her property.

MR. MCEACHARN: Yeah, Dana McEacharn again. When I came tonight, I kind of thought the choices were the clappers or the new bridge, but you just kind of clarified something by saying that there was more trouble with the dyke than just the clappers. Will you be more forthcoming on that?

MR. ANDERSON: Well, what I am telling you is that there are two bridge replacement options. One of them is to keep the saltwater out, which is the way that you are now. And one of them is to put a conventional bridge back in which would allow the saltwater to freely flow back up into this area.

And what I'm also telling you is that the condition of the bridge that's there now, puts it in a condition where the Department of Transportation cannot go back in there and just fix what's there and put new flapper valves on the end of it and stuff and take care of the issue that you guys are having with the additional saltwater getting through and stuff. It has to actually be excavated out and a new structure needs to be put in there so that for the next 75 to 100 years you have a maintainable structure in there.

MR. MCEACHARN: How much of the dyke is that

going to take to do that renovation?

MR. ANDERSON: We don't know at this time. If we put back in --

MS. GATES: As little as possible.

MR. ANDERSON: If we put back in culverts with gates on them, the area will probably be roughly the same as it is now.

MR. MCEACHARN: Which is?

MR. ANDERSON: But it might not be -- actually, I think it's 4, 6 foot by 5-and-a-half foot culverts, so -- but it probably won't go on the same spot. It would probably move on the dyke one way or another because in order to maintain your flow and stuff through there, it's easier to build in a different location and then take something out.

Have I answered your question?

MR. MCEACHARN: Yeah, I keep being struck by the fact that in order to build a bridge, you have to remove the dyke.

MR. WIGHT: I will expand on this a little bit too is -- and we talked about this last week down in Addison -- is this, you know, this whole embankment also acts as a dam. There is a lot of water filtering through this and if you want to keep the current situation the way it is, you know, you've got to

seriously consider, you know, putting in what we call a cut-off structure in this embankment to keep the water from going through because right now it's very pervious and the water just kind of percolates right through it. So potentially, you know, worst case, you know, the project could be this long, the whole causeway, kind of worst case.

MR. MCEACHARN: So you kind of create the embankment on either side or one side so they won't be so permeable?

MR. WIGHT: Yeah, essentially we'll kind of dig out a slot in the middle and put some material that water can't flow through, like clay or concrete or a steel wall, something to that effect.

MR. ANDERSON: We're not really sure what -- if we are going to do -- we are not sure what needs to be done at this time. I mean, a certain amount of saltwater flowing up through there is not really a problem. The bigger issue is when you get the big culverts and the water flowing directly underneath them, pulling soil out from underneath it, that's -- that's a huge -- that's a structural issue where eventually something's going to fail and your roadway's going to settle and may not be able to be fixed quickly.

Go up to the back. I'm sorry.

MR. SHAW: I'm Wayne Shaw. I work with the Down East Salmon Federation. I work for the Salmon Federation and know that salmon have gotten a bad rap over the last 10 years or so Down East, but I know that most everyone in this room would like to see salmon back in these rivers. There's no doubt about it. And our organization is the -- represents that in that we know we have many, many members from all over the place.

We are building a hatchery over in East Machias and we have one over in Columbia Falls. We think we can bring these fish back, but we also think we can have our hay and our blueberries and other donuts and everything else that we need so much.

You alluded to one thing and I guess we call them smart clappers. And if you go out into Oregon and Washington, this is not a unique situation. Out there they have got lots and lots of these types of structures. And what they have done, and their salmon are a little different than ours here, they spend a lot more time in the estuary and a lot of the young ones come out of rivers and go down these estuaries and that's where they get to the small side before they go out into the ocean. It's very, very important

for some of the specific salmon to have these estuaries. Atlantic salmon, it's a different story.

But I think that some of the lessons learned out there might help us here and that's this clapper that can allow some fish to move through or fish to move through. And it's not easy to get all fish through this. They don't all like the same types, so it might allow smelts through. It might allow tomcod through, maybe not salmon so easily and/or the reverse could be the case.

So I think if people up in Marshfield -- they have a brook up there called Smelt Brook. I don't know the last time it was that it's seen smelts. It must have been 170 years that it's seen a substantial number of smelt.

I think what's different here than over in Addison is that the Addison gates were not nearly as old. And there were some old-timers there that came out of the woodwork, and some of them were up in their 90s and said, I remember before these gates were put in and I remember what that was like and I would like to see that in their blueberry fields and work in the woods and so on. And they actually came out and said, I would like to see it reversed. Some of them are landowners that have marsh grass that they have cut.

So it's not always the same in every situation. But maybe this smart gate thing could work. I don't know.

MR. ANDERSON: Thank you.

Yes, sir.

UNIDENTIFIED SPEAKER: My good friend, Bob Costa knows about the value of the land, how it becomes more valuable.

MR. COSTA: Well, I'm not a realtor, Ed.

UNIDENTIFIED: Well, I got to thinking -- we got one here. I got to thinking, the last Legislature passed the bill, we own about approximately 150 acres on what was on the Old St. Regis pasture, which was sold, of course, to your father to raise cattle on.

Now, we just passed a bill, a nesting bill, right, so we lost a large portion of our land up there in Middle River anyway. Now, if it floods, we're going to setback, what, about 250 feet. Perhaps DOT and the State of Maine would like to buy that from us to use it for bird watching or salmon watching or something.

We've already a lost substantial piece of land there and we're going to lose a substantial piece more, so it wouldn't be much value to try to sell the subdivision. I'm sure the Spragues are facing the

same problem and they are.

Think about the setback, two setbacks would be within the short period of time on your land, still getting taxed for it.

MR. ANDERSON: Way back.

MR. LARSON: Yes, Richard Larson, Machias. From a cost-benefit analysis and federal government versus state government, through enhanced communication, I am concerned that if there is a delay that number 3 could be a 2 or a 1, in other words, the priority. I think you said that a 10 is very good, 3 is not so good, 2 is worse and 1, well, we don't want to think of that. But if we wait and there is a holdup at the federal level, which is supplying 80 percent of the money, and the state 20 percent, that is a concern of mine.

So what can be done to come to an agreement and to get the information to the federal government, which seems to be holding the purse strings, because I don't think a delay is the action that we want. And the government might be thinking that's what we want if we cannot come to an agreement.

MR. ANDERSON: Go ahead, Judy.

MS. GATES: I'll throw myself out there. We do everything we can at DOT to permit what we need to permit as quickly as possible. We have very efficient

working relationships with the regulatory resource agencies and they respond to our priorities.

What we're trying to avoid here is having it delay enough that it fails and we don't want that to happen either. Because if that happens it's a bigger -- you know how when your furnace blows up, it's a lot worse than if you replace it before it blows up. Same idea here. And we have been able to work really well with the agencies.

We don't really anticipate this project taking necessarily any longer to permit. It's that we need a lot more information because of the potential results of one of the designs that could be chosen. And we want to do that very carefully. And we're moving as fast as we can for the money we have. I know a quarter of a million dollars sounds like a lot of money. It actually comes from a completely different place than the federal agencies that you see in this room. There is no connection in that. So the condition that's going to drive the federal money that funds the replacement and our desire to get things done as efficiently as possible on the permitting side is going to drive how that happens. So it all comes together, believe it or not, like soup, so it works at the end.

MR. ANDERSON: Yes, sir.

MR. HANSCOM: Ivan Hanscom again. I've done just a minimum amount of permitting. My understanding is that it's much easier to get a permit when you stay within the footprint that's existing rather than expanding and involving a larger area.

MS. GATES: Yes, that's true. And that's why we are going to try to do exactly that.

The issue here is the installation is going to require us to do quite a bit of excavation and that's what's triggering the need for a federal permit.

The replacement itself, if we can stay within the existing footprint, is going to be a relatively easy permitting process on the state side. But all those agencies still get to put in their two cents and say what level it should have for permits.

So every effort is made to stay within the existing footprint always for that reason exactly.

MR. ANDERSON: Thank you, Judy.

Yes, sir.

MR. COSTA: I had a question about the regulatory process. Are you going to be inviting or is the Maine State Planning Office Flood Plan Management part of the process? Is the Federal Emergency Management Agency part of the process? And the reason I ask that

is because it's fairly common knowledge that like Louisiana, a lot of us behind the dyke are below high tide.

The other thing I wanted to ask was whether or not your agency had knowledge of existing flood patterns? For instance, it's not uncommon for the water presently to cross Route 1.

And lastly, I wanted to ask about whether or not your project has an eye towards compliance with executive order 11991 and 11990, Flood Plan Management and Protection of Wetlands.

MS. GATES: Yes, all of our projects comply with the Flood Plan Ordinances. We also have an agreement with FEMA with actually MEMA, who is the FEMA representative. And we incorporate that into all of our bridges, so we take care of that, that part of that.

In addition, the last part of your question which was --

MR. COSTA: 11990.

MS. GATES: Yes. That -- that's a really interesting statute because what it does is it says all state agencies have to comply with the Flood Plan Ordinance. It's part of the planning statutes. And we do that. But we don't have to actually go through

a formal process to do that because we are actually not part of any municipality. Our roads are roads. They're not necessarily zoned as part of the municipality. It's a very, very gray legal area. I can't even begin to explain how they get there, but we have had the discussion with several towns before and the way it works is we comply. And FEMA assures that we comply, but we don't do it through a formal process.

MR. COSTA: Is the planning office, Flood Plan Management, will they be part of the analysis once you acquire the topographical information?

MR. WIGHT: As a general rule, we don't include them on the front end. We include them on the tail end once we complete the analysis. That's generally how the process works.

MS. GATES: Because we don't rely on their data. We do our own.

MR. WIGHT: I mean, we do our own analysis and we work with the community and, you know, if there is a change -- significant change in hydraulics, you know, we'll determine here's what the new base flood elevation is that, you know, determines where folks need, you know, flood insurance and where they don't.

MR. COSTA: Thank you.

MS. WOOD: Hi. My name is Stephanie Wood. And you heard my dad speak earlier about my husband losing his hay crop if this was allowed to flood. 1400 bales of hay might not mean a lot to a lot of people, but to us it means something.

And more importantly than that is you would be taking away my children's backyard where they play, where they observe more than hundreds of ducks, geese, cows, horses that belong to Geary Albee, moose, deer, fox, coyote. So you're also impacting their lives, as well.

MR. ANDERSON: Thank you.

Yes, sir.

MR. LYFORD: My name's Al Lyford. And I only own about 3 acres there, but on that 3 acres sits the mini mall. And I can envision that body of water that you've got on the other side of the dyke there coming over there probably two and a half times. The elevation's not going to have to be over 3 feet and you're going to flood that whole area, which would create wave action, smell.

I just want to go on record as saying no way do I want to see a bridge go there. Take out a septic system, perhaps. Take out a well. To close a considerable investment down for some salmon so he can

go up there any time he wants, I just can't help but think that this salmon thing has an awful lot to do with this.

UNIDENTIFIED SPEAKER: It does.

MR. ANDERSON: Thank you.

Yes, sir.

MR. HANSCOM: Just a little bit about the salmon. This gentleman here is the authority on the salmon. He pretty much told us that his organization might even support this -- what was the word you used?

UNIDENTIFIED SPEAKER: Smart clapper gate.

MR. HANSCOM: Yeah, smart clapper gate. We can put people on the moon and all that stuff. I don't know why you can't use the smart clapper gates.

MR. ANDERSON: Yes, ma'am.

MS. DEAN: My name is Sharon Dean and I'm a resident of East Machias. I am involved with some businesses in this area. And one of the businesses I'm involved in has to do with social services. Right now I'm very aware of how much money the state doesn't have. Realistically, you have done some projects, I expect like this, where you're -- I know you don't know the cost of this bridge that lets saltwater through versus the clapper system exactly, but is there a -- somebody said 25 percent, might it be 25

percent more, might it be a range, 30 percent? Is there -- is it generally more expensive to do the clapper?

MR. ANDERSON: Quite frankly, we don't have any numbers for this. We have got two bridges of this type in the state of Maine. And we are working with both communities right now. We are on the front end of this. And as we progress, when we come back to our next meeting or it may be the following meeting after that, we will have better numbers to share with you as to what the costs and stuff are, but I don't have any right now.

MS. DEAN: And the second part of this question was, I run into just the harsh reality that it -- no matter how much people want or how much it gets on the record what the people want or the businesses want, that if the money discrepancy is -- and it doesn't have to be real large, just a little large, the State just says there just isn't money. You know, it's too bad if this is the way it's going to go. And if that's the way it's going to go at that point where it looks like a bridge is cheaper, why put us all through this and why put yourself all through this unless realistically there is a realistic chance that you can say, yes, it's more money to do it this way, but this

is the best way. This is what the people want. This is what the businesses -- this is what the ecology of the existing animals that are here for 140 years we want to keep, rather than, you know -- realistically, can you answer that or probably not?

MR. ANDERSON: Well, I can answer part of it. I work for the Department of Transportation. My job, as a project manager, is to, when we replace a bridge, is to go out and get public input as to what the public wants to see for each location where we replace a bridge. I have to hold this meeting. I want to know what you folks' concerns are and we want to incorporate as much stuff as we can that you guys bring up as concerns and stuff into our project so that we can make the best project for your community that we can with what money we have to spend to do it. That's my job.

So I mean, we do get caught up in the red tape. We do get caught up in other things, but you people's voice has to be out there in order to get around that because if you don't bring out your concerns, then it's not going to change it.

MS. DEAN: So you would be the decision-making person on how much money, not you personally, your department on how much --

MR. ANDERSON: I spend a lot of the State's money but --

MS. DEAN: Is it the Legislature? Is it you personally? I mean, is it your department?

MR. ANDERSON: We will go through the process. We will figure out how much the options cost. We will be talking to the agencies to find out what input they have as to what directions they see that they want to go in. We have the information from you folks. We will bring additional agency people in here to sit down and hear your concerns so that they can incorporate that into their decision-making matrix so that we can come up with the right solution for your community. It just takes time. It really does.

I mean, you need to express your feelings. You need to express your concerns. You need to have the right people hear it and then we move forward to do the best that we can.

MS. GATES: If we already knew the answer, we would tell you we did, but we don't. I mean, really we haven't -- we don't know the answer here. So we would -- it would be like most other projects where we had two meetings and everything else. If we kind of had an idea what the end result would be, but we don't. So this is kind of a new thing for our office

for the bridge program.

These are unique structures. And we don't have as many tide gates in Maine as Oregon, for instance, does. And I just want to -- before we jump onto the fish-friendly clapper gate railroad train, the two things I know about those gates and about Oregon, Oregon actually has a tide-gate policy, their DOT, which says they will not pay for the replacement of any tide gate ever. Those have to be privately funded or commercially funded in order to be replaced. It doesn't mean they don't work. It doesn't mean we won't pay for it. It doesn't mean anything. I don't know anything about those gates, but I do know that in a place where they have these and they're supposedly more common, they're pretty strict about putting them in. So we want to make darn sure we know everything about those structures before we put one in here and create a maintenance nightmare or a flooding issue or something else. So we have got a lot of research to do.

MR. PELLON: If you listened to everybody here, except the people who are an agency that have to do with the salmon industry, 99 percent of the people want the gates back in. The only people that don't seem to want the gates back in are people who have got

a vested right in the job in the industry.

MR. ANDERSON: What was your name, sir?

MR. PELLON: Edward Pellon.

MR. ANDERSON: Thank you.

Yes, ma'am.

MS. COOK: Sharon Cook. If we don't put these clappers in because it's too expensive and we end up with a bridge, has anybody talked about the bridge that would probably have to be built on 192?

MR. ANDERSON: All of that stuff needs to be incorporated in. If you put a bridge back in here, the next bridge up would definitely have to be looked at as part of that whole process.

MS. COOK: Okay. Because that would mean two bridges now.

MR. ANDERSON: Yes, it would. You're right.

Up in back. No. Chris.

CHRIS SPRAGUE: One thing, and this actually applies over in Addison also, there is a boat landing -- a boat landing located at the mouth of the clapper system. If the clappers are removed and just a narrow bridge is opened up, the water rushing through the narrow opening will produce a violent torrent of water. How do you protect boats and people from being sucked through and potentially killed?

And once again, I understand that things need to be replaced, whether it's going to be a clapper system -- to me if it is opened up for water to flow through, the original water plain if you look at your table, there was like a little pond right across from Dunkin' Donuts. Right there. That black hole right in front of you. That is actually the edge of where the river bed used to be. Dunkin' Donuts was still there. And to me when that tide originally came in 150 years ago, it was that wide. And so when the tide came, it was a fairly even flow up into this large basin. If you just open up a narrow piece, that's going to be so violent that it's going to be -- to me it's going to cause erosion.

I don't know what kind of a system you would have to build. I know you talked about water percolating through the bridge, but for that narrow piece of opening, that's going to affect downstream beyond -- to me it's going to be so costly for what you would have to put in to allow for that water flow -- if you keep it narrow, it would have to be built -- it would have to be long riprap on both sides. If you widened it up, it's that much more costly than it would be just to fix -- not fix, but replace either a conduit system or a bridge system with clappers.

I think a question for you as far as bridge replacement compared to a narrow channel system that's there with clappers, which would be more expensive just -- and that would -- you know, not even thinking of bridges upstream, just in that one location?

MR. ANDERSON: Yeah. I don't know. I don't have an answer for you right now.

CHRIS SPRAGUE: I personally can tell you it would be more expensive to put in a bridge just because of what you would have to put in. You have boats, so you would have to have an arch so boats could pass up through there. Thanks.

MR. ANDERSON: Okay. Thank you.

LAUREN SPRAGUE: Lauren Sprague. I know I have been hearing a lot recently about concerns about decrease in deer herd. And I don't know, maybe Tom could tell us, but I think in this area that's probably one of the best places for deer habitat. I think probably more deer were harvested there this year than probably most anywhere else in Washington County.

UNIDENTIFIED SPEAKER: Ssshhh.

MS. GATES: It's on the public record.

LAUREN SPRAGUE: That's okay to have it on the record. That shows they're driving. That's what his

job is for is to keep those deer there so that people can do that.

MR. ANDERSON: Can I have permission to hunt up here next year?

MR. ALBEE: Geary Albee again. To compound on Chris's comment, upstream up 192 up there by Middle River up through, we've lost a bridge at the foot of our driveway twice by spring floods, runoffs they come out of Marsh Lake. In the springtime, when the ice melts, there's a torrent of water that comes down through there. And right now this new bridge with iron girds and all has had water running over it. If it hadn't been for the weight holding them bridges down again, we would have lost the newest one. Compound that with extremely high tides in the springtime, which Chris has noted, coming upstream, all that much water coming up as a head pressure and then flowing out through like he's trying to say, a narrow opening, the gush and the wash and the hydraulics are going to be a lot more than the resistance of clappers holding an equilibrium between the two tides that would really rip through there and you're going to wash a bridge out on Route 1 and really cause a lot more havoc, I believe. Your study will reflect that, I believe. Thank you.

MR. ANDERSON: Thank you.

MR. CHERRY: Bill Cherry again. And in supporting what Geary was saying is the old Town dump that is on the left-hand side just barely out of sight -- yeah, right there -- with the increased energy for that water flowing through you can expect that you would have a dump to clean up because there is batteries and --

UNIDENTIFIED SPEAKER: Old cars.

MR. CHERRY: Old cars and everything. I can just barely remember that as a child. So that would be uncovered.

MR. ANDERSON: Thank you.

Yes, ma'am.

CAROL SPRAGUE: Carol Sprague again. As a former owner of McKenzie's Market, that set right where Al Lyford's building is today, because of the way that's built and because of the way when it flooded down there because of that water coming down from Marsh Lake and whatever, it would always go in the back of the store. Never has the water run under the door in the front of that property.

And may I just put on record now that we sold this property to Al Lyford. If I still owned that, I would be having the biggest conniption fit that there

ever was at this time. And I feel very sorry for Al Lyford to even have to face this problem looking at the fact that he is going to lose the investment that he's put into this property, if this happens.

MR. LYFORD: How much are you going to compensate these landowners for anyway? Are you going to compensate them at all? Surely you can answer that question.

MR. ANDERSON: Any time that we take rights for a roadway project, we compensate -- we have a right-of-way process. We get the information. They make offers. I don't know exactly what the rules or laws are with respect to title influence and stuff upstream of a dyke or a dam. That's stuff that's going to need to be looked into.

MR. LYFORD: Well, I mean, how much are you going to compensate me for if you take my building? You know, you got to add at least a million and a half dollars to your budget.

MR. ANDERSON: If we are taking a building, we would pay fair market value for it.

MR. LYFORD: Well, I can tell you what my fair market value is.

MR. ANDERSON: We do have a process, there is -- there is -- it's set up in different phases. If the

right-of-way office makes an offer on a property, the owner has the opportunity to say, no, I don't agree with that amount and there's a process set up to continue to approach and try to get more money out of it. I don't -- it's not my area of expertise. I really prefer to replace bridges and move on.

But, yes, sir.

MR. ALBEE: Geary Albee again. Just for information, if anyone in the room tried to paddle a canoe from the dyke up through Middle River there, I have in the past, you will strike bottom with your paddle. You cannot get a full blade of paddle. It's deceiving looking up across thinking you have got a deep channel. You do not. It is filled with sediment, very, very deep. Your canoe will almost drag, not drag, but you will have a half a paddle. That's all you get in the middle of that right there. It's full of sediment. That will mean something washing into the middle of the Machias River. The salmon won't like that either, or the boat launch will fill right through.

MR. BURNS: Devin, I think you've heard a lot of very important information here tonight. And it's pretty clear as to what the balance is, at least from this group. I know that the Department will take that

into consideration. And I really hope that the federal agencies that are represented here will take that into consideration too because I do represent the people, not the fish.

MR. ANDERSON: Thank you very much.

Yes, Chris.

CHRIS SPRAGUE: Before the current dyke system was built, the early settlers built many dykes along both sides of the river. If the dyke is to be opened those older dykes will continue to impact the flow of water. Will they have to be removed also and at what cost? And there are miles of them.

MR. ANDERSON: I don't have an answer for you.

CHRIS SPRAGUE: Right. Just you want information --

MR. ANDERSON: I do.

CHRIS SPRAGUE: -- to chew on tonight.

MR. ANDERSON: Yeah, I do.

JOHN SPRAGUE: John Sprague. Look, thanks for putting up with us, can I say that?

And just for something humorous because I'm going to go, I think you know how we feel and so forth. But for something humorous, we are very different Down East and so forth.

Ask Christopher how much his deer stand cost him,

ask him. I have to, about two days a month, push the deer out of the way to get to my driveway, so.

MR. ANDERSON: I thank you all for coming tonight. I appreciate all your input. We will back again in the spring.

(The hearing was concluded at 8:25 p.m.)

CERTIFICATE

I, Melissa L. Thibodeau, RPR, a Notary Public in and for the State of Maine, hereby certify that the within-named deponent was sworn to testify to the truth, the whole truth, and nothing but the truth, in the aforementioned cause of action.

I further certify that this deposition was stenographically reported by me and later reduced to print through computer-aided transcription, and that the foregoing is a full and true record of the testimony given by the deponent.

I further certify that I am a disinterested person in the event or outcome of the above-named cause of action.

IN WITNESS WHEREOF, I subscribe my hand and affix my seal this 4th day of January, 2010.

MELISSA L. THIBODEAU, RPR,
NOTARY PUBLIC
Court Reporter

My commission expires: February 28, 2015.

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STATE OF MAINE

DEPARTMENT OF TRANSPORTATION

TO DISCUSS THE FUTURE

IMPROVEMENT OF THE DYKE BRIDGE

WORK IDENTIFICATION NUMBER 016714.00

FEDERAL AID PROJECT NUMBER BR-1671(400)X

Reported by Lorna M. Prince, a Notary Public and Court Reporter in and for the State of Maine, on April 2, 2018 at the University of Maine Machias, 116 O'Brien Avenue, Machias, Maine.

REPRESENTING THE STATE: MICHAEL WIGHT

MR. WIGHT: We'll get going. It's a minute or two after six. I'd like to thank everybody for coming tonight. Tonight we're here to talk about the Machias Dyke Bridge project located on Route 1 over the Middle River. Tonight we're having a preliminary public meeting. My name is Mike Wight. I'm with the Maine Department of Transportation Bridge Program. I'm the senior project manager on this project.

I'd like to go over a few quick housekeeping things. If you haven't grabbed some goodies, help yourself after the meeting is over, copies of notice that most of you received in the mail or saw in the paper. The most important thing is after the meeting if you think oh, I got some questions, my contact information is on the bottom of this, also some business cards. Folks whose property may be directly impacted, we have this great booklet colored blue. It talks about our right of way process. It's got a lot of great information, help yourself to that. We also have a booklet talking about our civil rights office and if you have any concerns, there's contact information about that. I don't think everybody signed in. I'm going to circulate two sign-up sheets, if you folks could sign in. I'll start on this side, just pass it back. We'll go on this side.

I've got about 30 plus slides I'm going to go through. I'm going to kind of give some background information on the project, kind of why we're here. We've done kind of a feasibility study. We looked at a variety of options. We're going to review those different options and talk about different reasons why we picked our preferred option and I'll explain our preferred option. And once I've completed that, I'm going to open it up for questions and comments at the end of meeting. At that point I'll ask -- I'll pick on people one at a time, if you could raise your hand, state your name for the court reporter. We have a court reporter here to have a record of everybody's comments.

To start off, I think everybody knows where we are, but here's the Dyke Bridge located on Route 1. This is the Middle River that heads up from Machias into Marshfield. Immediately adjacent to the bridge we have the Machias River. Downtown is kind of located mostly to the east. Again, just an aerial view. Down here is the Dyke Bridge on Route 1 and this just kind of gives a graphic showing the area covered by part of Machias and Marshfield.

And again, focusing on the key area here is Dyke Bridge, which is not quite in the middle of what a

lot of folks call the causeway. For reference, here is the mini mall with the Dunkin Donuts to the east and Helen's restaurant down to the west and here's the boat launch. The causeway has got multiple elements that have to be dealt with on this particular project. You got Route 1, which is a major highway, consists of two 12 foot travel lanes, two 8 foot shoulders resulting in a total width of about 40 feet. There's also an area of parking pretty much the whole length of the causeway. We have utilities. We have some significant aerial utilities in the area. We have some drainage features. There's kind of a ditch here between the parking and the trail and right from Machias River we have the Downeast Sunrise Trail.

Talking about the Machias Dyke Bridge itself, number 2246, the structure itself consists of four 6 foot span by 5-and-a-half foot rise by 130 feet long timber box culverts that have flapper gates on the downstream side. The flapper gates themselves are reinforced concrete panels with a metal frame and this particular structure is given a rating of four, which in simple terms is a structure that has some considerable damage, and I'll go into that in a little more detail. We rate all the structures every two years that are considered bridges on a scale of nine to

zero, nine being excellent condition, zero being closed and this structure is a four.

This graphic just shows a cross section. We took a knife across the structure. It shows the four culverts, one, two, three, four and these are all constructed of heavy timbers all the way around and underneath the timber culverts is a series of timber piles that support the structure and surrounding pretty much the whole thing is rock and timber cribbing.

Just a few pictures, a shot at low tide, the tide down below the bottom of the culverts, comes out at a pretty good velocity, shot on the right here, kind of around mid-tide, roughly the point the gates close up. Here's looking at the upstream end of the culvert. Without the gates you can clearly see the openings and the timber, heavy timbers make up the box culverts and on the other side as you kind of see the upstream mostly fresh water pond, and this pond I'll get into in some other graphics, you don't have a lot of rainfall, it varies about a foot plus or minus during the course of the tide cycle. The structure itself in the embankment do leak a little bit. It's not perfect keeping water out.

Here's a few pictures to show you what the structure looks like. On the left here looking at the

ceiling of one of the box culverts and there's some wood missing. There is definitely deterioration of the timbers and there's some rot and it's tough to see, but I think this is in the area where a number of years ago we put a concrete slab over the top of it where we was having problems with fill leaking down from the roadway down into gaps like this.

The picture on the right, picture ten, you're looking at the backside of the flapper gates. Look closely at this picture, you'll see lines going up and down and sideways. That's the reinforcing steel that should be inside the concrete and now it's all exposed. The bottom half all of that reinforcing steel is exposed and corroding.

And again, this was an inspection done by our dive team back in September of 2016. I give them a tip of my hat, they had to time this perfectly in order to do it safely to do this inspection. Again, just a few more pictures from that inspection. Again, a picture on my side just shows some more rot of these timber members. On the right side of the picture, every 5 to 10 feet roughly there's an extra bracing around the box culverts and if you look closely, it kind of slopes, and this shouldn't slope and there should be a member going all the way down. Over the years this has worn

away with the wear and tear of the water.

That's the structure. Here's some roadway information. Again, this is Route 1, Main Street. Again, you have 12 foot lanes here and 8 foot shoulders. The average annual daily traffic, if you look at it kind of averaged out over the entire year is 9,250 cars. This is what we call a corridor priority two. DOT has a corridor priority system across the state, with the Interstate being number one and Route 1 is right up there second on the list. First priority all the way down to priority six, which is local or town ways.

Jurisdiction, this is a State road or State highway, the classification of the road, it's a minor arterial. It's connecting the major places in Washington County and the speed on the structure on the causeway itself it's 35 and a little ways past it drops to 25. I hope folks are paying attention to that.

I'm going to review some history for everybody. If you folks want more history, let me know. I have somebody anxious to talk about it. Back in 1835, going way back, this used to be a private toll bridge before there ever was a causeway. About ten years later in 1845 the town purchased this private bridge, became a municipal piece of infrastructure.

1866 is the key thing. The state legislature authorized the town of Machias to build the Dyke and two years later in 1868 the Dyke completed. Folks I guess liked the area so much, in 1877 the Machias Park, today you folks call it a fairground, was open to folks. That was kind of on the easterly corner and I'll show a graphic of that in a little bit.

In the 1890s the Washington County Railroad came through and the causeway was widened to accommodate the railroad. Jumping ahead to 1930, the current structure was built, that's the upstream piece. That was the first section built. In 1944 the structure was widened on the downstream side. Getting to fairly recent in summer of 2008, I believe, the Department had to make some repairs to the bridge. Like I showed in the earlier slides showing the rotten timbers, well, we had a number of them and fill was basically leaking down into the box or over settling and we basically did a temporary repair. We constructed a concrete slab over the top of the box to prevent any more fill leaking down where we had rotten or missing timbers and that basically bought us some time. That was a Band-Aid.

So this repair kind of kicked the Department in thinking okay, we need to start working on this

project and set aside some preliminary engineering money and in the end of 2009 we did a public meeting and had our initial discussion about the project and set a dialogue with the community. After that we -- in 2001 our folks came out here from DOT to do some survey work on the ground. We also did some aerial survey covering the good chunk of the drainage basin upstream. As part of our work and concerns about the businesses east of the bridge, in 2013 a forced sewer line was extended to the east end of the causeway, I believe serves the mini mall.

In 2014 DOT basically started work on a feasibility study. I'll get into that in a lot more detail in a minute. Just a fun picture or two here. This was back in 1930, the original piece of the structure that's out there now was built. It's a little tough to see, but underneath the roadway surface that's out there right now, basically there's a huge grid, what we call timber cribbing. They piled timbers this way, this way, this way and they dumped in rock all around this. That's how they filled in this big gap right after the Civil War. And if you look really, really close, you can see water kind of trickling out right here, it's tough to see. This is where the structure is. It's tough to see.

This is from our existing plans. Again, this is like taking a slice down the middle of the road and it shows the timber cribbing. That's what they did, they piled up logs and they just crisscrossed them and built this up to fill in this roughly 7, 800 foot gap to create the causeway and hold back the tide.

Just a graphic showing how the culvert was extended in 1944. This is the downstream side. This is the -- this end is the 1930s piece. They extended it downstream. They put in basically timber piles every 5 feet. Essentially you ended up with a forest of trees driven into the ground and they constructed the four timber boxes on top of it and you have timber cribbing and rock all the way around it.

Again, this is the construction in 2008 when we did kind of our concrete slab life extending project. Basically the culvert, the timber culverts are right under here and we put this slab in to prevent soil from leaking down or missing some wood. Just for reference, this is the old Helen's in back. This is roughly where the parking area is. We can see the utility poles right there. So basically we built this slab kind of over the older piece of culvert, which is in a little more tender shape.

In December of 2009 we had our initial public

meeting. We just threw a couple of concepts to talk about, get folks feedback. One was kind of replacing in kind and one was what do folks think about opening it up and letting the tide in. One of the big things we got that meeting there was significant opposition to removing the tide gates, especially from property owners in the area. In a nutshell, you know, the property owners, they were going to be impacted upstream. They did not want their properties inundated with water. We had a pretty similar crowd. We pretty much filled the room and I can say DOT did hear it loud and clear the concerns about encroaching on folks' property upstream.

So, we've done a lot of data gathering. One of the big things is what's the water elevations do at the site. We put some gauges upstream and downstream of the structure. I'll explain the different colors. This kind of dark color in the middle, this kind of up and down, it wiggles about a foot, this is the gauge we put upstream in the little fresh water pond. This little wiggle means, you know, the flapper gates aren't perfectly tight, a little bit of water does leak by. It wiggles about a foot, plus or minus, you know, there's a little bit of leakage and it kind of goes with the tide cycle and that upstream pond kind of

wiggles up and down about a foot during the course of the tide cycle.

This little bit lighter kind of bluish purplish, this is the data we took downstream over about a four month period and just to kind of check is our data good and right, this yellow way in the back, this is the tide gauge at the Eastport, way down in Eastport and generally the further you get away from the ocean, the tide range goes down a little bit and this data kind of shows that. We're kind of inland a little bit from the ocean, not too far, but enough to -- the tide range is just a little less, so that was one of the first things we did was get some tide data to get a handle on what is the water doing here. This is just a quick summary. The actual causeway itself, roughly in the center line of the causeway, it's around 11, just shy of 12 feet. That's kind of the elevation at the top of the causeway. I know recently FEMA has been updating flood maps around the state and it came up recently, I think it was 2017, kind of a hundred year or one percent chance of flood is around elevation 11 and the data that we collected over four months, the highest tide that we got downstream during that four months was about 9.8 feet, which is a pretty big tide for the year. I won't get into all the rest of this,

but we got some good numbers to start our analysis.

We also looked at the immediate bridge area and also the surrounding area, what are there for historical resources, what are there for archeological resources. Our biologist went out to walk the stream, he's here today, so we'll look at what impacts there are to natural resources in the area. One of our big findings is a historic property and it's the remains of the oval horse racing track. This is a Google map and you can see pretty clearly, this is back from the -- basically when this was a fairgrounds about ten years after they built this and it used to be kind of the fairgrounds area, this whole corner, and, you know, this racetrack is still here and I've been told, you know, folks do occasionally walk it, snowmobile it, ATV it. It does get used and we've researched this to determine this is eligible for the National Historic Register as a historic item. I've been told this is kind of a unique racetrack. If you look closely, it's not symmetric, it's an oval shape and it's one of the -- I think it's one of the only ones of this kind in the whole state. They did an oval track back in the day, you know, if you was racing it, it's a little more challenging, an oval track versus a symmetric track.

What this triggers is because this project

has federal funding, we have to follow the National Environmental Policy Act and one of the things this triggers being a historic property it triggers Section F applies. In Section F under NEPA applies for historic sites of natural state or local significance in public or private ownership, so it could be a public property, it could be private property. Generally it's a park, a recreational area of state or local significance and in the case of this one, it's the only racetrack of this kind as far as we know in Maine or it's a publicly owned wildlife waterfowl refuge of national, state or local significance. It's open to the public. The third one doesn't apply, but the top two kind of apply to this particular option with the racetrack.

Under the NEPA umbrella, Section 4F, it's kind of a three-step process you go through. The first option is to look at alternatives that avoid impacts to that particular resource. In this case what options avoid impacting this oval racetrack? Those are your preferred options. You need to look at those first very, very closely. Second, the second option is okay, if there's -- if no option is prudent or feasible, okay, how do we minimize impact to that resource? How do we minimize impact to that racing track? And the

last option we hate to get to is okay, a particular option is going to really seriously impact this historic resource, how do we mitigate it? The key thing with Section 4F is one of the few mechanisms under the NEPA law that basically says, it pretty much dictates you need to do this option if there's a prudent and feasible option that avoids the historic resource. So it pretty much dictates you really need to pick this option unless you've got a good reason not to. And that's a big factor in this particular project picking our preferred alternative.

We'll talk a little bit about the feasibility study. The feasibility study early in this project we developed a purpose and need. I apologize for being how long and wordy it is, really the primary purpose of this project is to achieve an overall structure rating of at least eight. Our scale is zero to eight and a desirable structure rating of eight where there's no notable deficiencies that affect the condition of the structure and this is in accordance with the Federal Highway Recording and Coding Guide. So we want a structure that's in really good condition at the end of this project.

The second part of the purpose and need just kind of explains why are we here. The current

structure that's out there has a rating of four and that's based on our most recent underwater inspection I showed you the picture of and the inspection indicates generally you got large spalls where pieces of concrete are missing, heavy scaling, pieces of concrete are missing and in this case we got cracks and -- or loss and because of the timber we got the loss and rotten timber members that need urgent repair and unscheduled repairs like our 2008 project that we did. This is all based on the guide inspection we did in 2016 where we were able to get inside of it and really get a good look at it.

So as part of our feasibility study, we develop a number of different alternatives. I'll try to give a brief overview of the different alternatives. The first one is replacement in kind. Let's replace the structure in kind with flapper gates. Initially we looked at okay, we'll put back four 5 by 5 box culverts that will be made of concrete and being very brand new flapper gates, we anticipate there will be very little leakage or no leakage with that option. When those are -- flapper gates are engaged, you know, water is not really going to get through it all. And I'm going to focus on this middle column, which is really what's the change in water elevation upstream of the

structure. Because we have -- with the new structure with tight gates, we'd actually see probably a drop in that upstream pond. Initial analysis shows 1.6 feet. It's probably going to drop. We're not going to have leakage of the water through the structure with brand new tide gates. For this particular option it doesn't restore any tidal flow. It really doesn't provide any fish passage. There's really no change in property impacts. It's pretty much the same as what you see out there now. In the very early, just rough cost, about $2.4 million.

Now, these middle three options, we kind of looked at okay, let's look at some options where we get some more water upstream different degrees and, you know, what variations could we put in there using culverts with maybe one or two less tide gates. So first we looked at okay, let's put in five box culverts, but only four of them would have a tide gate on them. One of them would be totally open. So if we do that, that upstream pond is going to be 1.1 feet high, so a little over a foot higher. This partially restores some of the tide, you know, roughly half the tide, you got some sort of fish passage. One of the big impacts though, you're impacting about 36 acres of property upstream from the structure and real similar

cost. It's about $2.4 million.

The next option we looked at, trying to optimize the design a little bit, you know, do we really need five boxes, we looked at four boxes and only three of them would have a tide gate, so in essence one of them, one box is going to be -- have no gate on it at all. That option looking upstream, we're adding just a little bit more water at 1.4 feet of added water, again, partially restores the tide, you know, just a little less than half, half of the time fish can get through and a couple more acres, up to 42 acres upstream is impacted and gets inundated with every tide. Because we were -- got one less box culvert, it's just a tad less at 2.2 million.

And then we kind of looked at our culvert structure with the most restoration of tide and putting in four box culverts and only two of them have gates on them, two of them are just wide open for the tide. For that alternative, the upstream pond basically is 2.6 feet higher, again, you're partially restoring the tidal flow upstream. It's a little less, 45 percent of the time fish can get through. Being that this elevation is quite a bit higher, now you're impacting 63 acres upstream that get inundated. This option, similar to the previous one, is $2.2 million.

Now we make the big jump, let's really restore tidal flow. Right in the middle of the causeway let's put in 62 foot long bridge, no tide gates, no restrictions. This would consist of basically a highway bridge for Route 1 and very preliminarily we're thinking there would be a separate bridge for the Downeast Sunrise Trail, so you'd have two bridge structures there. This is the big change. The upstream pond is now going to be 6.8 feet taller and again, I just wanted to flag -- these are all rough numbers based on mean high, high water, not the worst case flood of the year, but just to give a relative number or each of them. Again, this does restore the tide flow. It does provide around 50 percent of the time you definitely can get fish through here. The big impact with this particular option is 286 acres upstream are inundated with water every day during the tide cycle. This option has significantly more costs at four-and-a-half million dollars, so almost double the other alternatives.

So we developed these options. We hired Stantec, they put together a report. They looked at all these different options hydraulically and looked at a number of sub variations on it to give us some rough ideas what happens with the tide. The next thing we

did was what we called -- we put together what we called a heat map.

What are the difficulties and challenges with each of these options and try to get a sense of which option is better, has less issues than others. And I'll apologize, there's a lot of information and it's tough to read. The big impression I want you to come out of this looking at this slide is generally the more red, the more difficult, the more challenging the option is to build. Starting at the top, we have replacement in kind. Basically it has the least challenges and we kind of scaled it from one to five, five being the darkest color, one kind of being the lightest. This will give a relative idea how tough is one option compared to another.

So, we start off here with replacement in kind. Three of the boxes, it's got some challenges, but most of them this is a pretty straightforward project to get done. We move down to these kind of three middle options, which are pretty close, but as you can see, a lot more color. There's a lot more issues with these culvert options that start to put water back upstream. So these ones are definitely more challenging, have more issues to deal with. Then you get to these bottom two ones and previously I talked

about a single span bridge of 62 feet, we got a lot of red. It's in -- most of these are in the fours. We got a couple of twos, some ones and some fours. We presented this -- these options, the previous slide, at a, what we call an inner agency meeting at DOT where we invite all the regulator organizations in for feedback and one of the issues that was brought up, you know, how come we didn't look at completely removing the entire causeway. And actually we looked at that option and it's a bridge a little less than 800 feet long at $24 million. It's a bridge that carries the road and the trail and this particular option has the most challenges. On our scale of one to five, most of these boxes are five. We have two ones, but pretty much the rest of these are all fives. There are many, many challenges.

DAVID BROWN: Is that the cumulative difficulty in the right column?

MR. WIGHT: I'll get to that in a minute. Hold that thought. That's the last thing I kind of want to leave with. We kind of added up all these numbers on the side to give a relative indication of how challenging are these different alternatives. Basically the top four, kind of all the culvert options, they're pretty close and this is just a tool

to help us pick an alternative, but these last two options have serious significant challenges to them. Cost being one, one factor, property impacts is another big one and that was a big issue at a previous meeting and talking to property owners. So these two options, you know, very quickly, you know, put to the bottom of the list for feasibility.

So that really kind of boiled down to we kind of had two broad options. We can kind of replace it in kind or okay, we got these ones that put some more water up. So those are kind of the two options we were debating.

GINNY BROWN: What was --

MR. WIGHT: Hold your thought and I'll get comments at the end.

GINNY BROWN: Okay, but it's about this map. I can't read where it, you know, the first one where it's white except those three things, I cannot read those three things.

MR. WRIGHT: Well, I'll read them, I'll test you on it later, okay. I apologize, it's a lot of information, there's a lot different issues we considered. Starting at this one working across, the first is design complexity, how challenging is this alternative. The second one is estimated increase in

the highest annual tide. How much is the tide going to change. The third one is the estimated increase in mean high, high water. On a relative scale how much is the water going up from option to option. As you go down the list, you know, basically there's no change here. You get further down the list, you got more water issues. The water is going up. The next column here talks about opportunities for fish passage. The current structure is pretty challenging. These other ones are slightly better and of course, you know, if you open it wide up, the most opportunities for Fish to come through.

We have an estimate of dredge material. Basically the stream bed material that's upstream, you know, how much material would we have to take out with these different options. These culvert options, we basically wouldn't have to dig out much of anything, but these bridge options, right now the culvert is kind of backed up sediments, you know, the culvert is up here and if we put a bridge in, it's going to be down here. A lot of that we don't even have a good handle on number, but it could be thousands of yards of material that would have to be disposed of or potentially working with our environmental regulators, you know, and I hate to even mention this, you know, do

we let this material just get washed out and right now we haven't done any testing. Our next phase of our project is we don't know, is there any bad stuff in it. That's a big cost driver and it's a big challenge to deal with all of that material.

After the dredge, impacts to historic properties, again, with the replacement in kind, you know, there's no change. These intermediate options you start to flood to the racetrack with high tides. These two options, replacing it with a bridge, whether it's small or big, it's getting flooded out twice a day. And like I said earlier with Section 7 of the historic properties, we're really pushed hard to what options can avoid impacts. As long as they're feasible and prudent, we are really driven to make that choice.

The next column talks about impact to parking on the causeway. We know this is used, especially in the summertime, folks park there, enjoy the view, have some food, folks sell stuff left and right. Basically all the culvert options have really no impacts to the parking.

AUDIENCE MEMBER: You missed one.

MR. WIGHT: Did I miss one?

AUDIENCE MEMBER: I'm just concerned about the three dark red ones. I hate to make you read

them all.

MR. WIGHT: The impact of the parking on the causeway.

AUDIENCE MEMBER: Restoration of tidal flow, is that what it says?

MR. WIGHT: Yup, I'll get to that one too. Sorry, I skipped one. Okay, this one is restoration of tidal flow. This is the big advantage -- excuse me, disadvantage here of the replacement options and the culvert options, you know, you're only going to have partial restoration of the tide. That's the big advantage of the bridge structures is restoring the tide.

This is tiny even for me. I should have made this bigger, but anyway, we talked about the parking on the causeway. And THE next one is, you know, property impacts due to the tide. You know, basically the culverts have minimal impacts, but then you got a big impact with opening it up with a bridge structure. Again, there's another similar column here about property impacts, again, real similar, you know, for the culverts, it's pretty small, but with the bridge structures, it's big impacts.

This next column talks about impacts to Stride Bridge. If you head upstream on Middle River,

it crosses under Route 192 in Marshfield, that's called Stride Bridge, and if we do any of these culvert alternatives, there's really going to be no impact to that upstream bridge; however, if we open it up with the bridge structure, so much water is going to get back there and we're going to have to do something with Stride Bridge. We'd have to replace that bridge and there's an added cost for that and added impacts.

Then we have, this one was a tough one, it's regulatory complexity. You know, it's variations on red the whole length, you know, replacement of kind has got challenges, but the other options have challenges and the replacement bridges have even more challenges.

The last one here I believe is shore land zoning. Basically, especially for the folks who live upstream, you go from a property that has been dry over a century to property that's shore land and not a big change with any of the culvert alternatives. The big change is with the bridge when all of a sudden there's hundreds of acres that have flooded.

GINNY BROWN: Thank you so much.

MR. WIGHT: You're welcome.

GINNY BROWN: I'll keep my mouth shut now.

MR. WIGHT: But to recap, again, the

bridges have the biggest challenges and we really put those to the bottom of the list, especially with the historic resource, you know, we have other options that have a lot less impacts that are proven constructible and that's the ones we were leaning towards.

After going through all of this analysis, our preferred option right now is we kind of want to match the hydraulics of the structure that's out there. We want to keep the tide out, but we also want to maintain that little pond that kind of varies up and down a foot. That's going to be kind of a challenge. We're thinking it's going to be either four or five box culverts. We haven't nailed in down exactly. It's probably going to be very similar in size with what's out there right now, you know, either 5 by 5 or 6 by 6 culvert. We're going to refine that more as we get into our preliminary design phase further.

All the culverts are going to have tide gates except one of them is going to have an adjustable gate. Somehow we've got to replicate that little variation of water that's upstream a foot. Right now we're thinking one of the gates have an adjustable gate that allows that little variation with a little bit of water through it.

And one point I wanted to touch on is the

exact location of the bridge may change a little bit. It may shift to the east. One of the big challenges of this particular project is how we keep the tide out and build a new bridge. One option is to kind of keep the bridge where it is, you know, and build a bridge next to it. That's still to be determined.

Why are we leaning kind of towards replacement in kind? Again, it avoids significant impacts to the upstream property owners. I know through a property owner at our previous meeting people were opposed to it. They didn't want to lose the enjoyment of their property. As I mentioned before, and I'll touch on again, it's the only prudent feasible option that avoids impacts to the historic resource, the oval racetrack, also avoids reducing the area of the upstream pond, which would be a negative to us. It would be a wetland impact and it's a cost effective option, you know, significantly less costly than putting bridges in there. Just to kind of illustrate the point, based on the max elevation that we gathered during our data collection, this kind of shaded area, this gives you a sense of how much of the area upstream is going to get flooded. It's a pretty significant area. It's around 400 acres. It is a -- it's a large area and this isn't even the worse case flood. It's

not a super duper flood either.

I think altogether, I mean, I know it's at least two dozen plus property owners that are impacted. Again, it's, you know, anywhere from 286 acres to over 400 acres if we opened it up. There's also significant loss of farmland. I know there's a farm on Marshall Lane on the -- kind of westerly side. They have a large pasture down towards the river. The good chunk of that, about 50 acres, is going to be flooded every day. Another example of the impacts on Route 192 at house 119 up in Marshfield, there's a trailer there, I believe, and it's almost going to be like almost going to feel like a moat around a castle. They're going to get surrounded by water every day and they have a good chance, you know, given enough time, their well may turn salty and their septic system may get compromised and, you know, just -- generally there's going to be more potential for flooding in the area. And another big underlying cause why we really don't want to put flooding back, it's this concept, it's a tough one, I'm not a lawyer, but it's called navigational servitude. It's a doctrine in constitutional law that gives federal government a right to navigate -- excuse me, regulate navigable waters under the commerce clause in Article 1, Section 8 of the constitution. And the

navigation servitude allows the federal government to exercise its power to regulate and control the nation's navigable waterways without compensating folks with resulting economic loss. That's the big thing. In a simple nutshell, if the structure is opened up, the tide comes up, and folks are impacted, I can't as a Department, because of this piece in the constitution, I can't compensate property owners. That's a big reason why we really don't want to make flooding worse upstream.

So that's our preferred alternative, basically replace in kind. We have 2.4 million in available funding right now and about 1.7 of that is for actual constructing the structure. This graphic shows a very rough schedule. This blue is kind of roughly where we are. We're partway through preliminary design. We've started the NEPA process. That process needs to be completed as part of our preliminary design process. Basically that's the next phase we're going into. We're going from this feasibility study, now we kind of picked an alternative and we're going to flush out all the nuts and bolts, how we're going to build that and hoping basically next summer, early summer, get the preliminary design completed and we'll come back and do a public meeting

at that point. And after preliminary design is completed, move into final design and very tentatively we're shooting for August of 2020, have that completed. That's when the project is actually advertised and awarded to a contractor and construction. This is a very rough number, it could be two -- right now I'm thinking it might be a two year project. A lot of it depends on how we maintain and manage the water on this project, how do we keep the tide out. We're also -- when we go through our project process, we're also given limits of when we can do work in the water. Right now very tentatively we're thinking we probably will be limited due to the Atlantic salmon, that we can only do work from roughly the second week in November to the middle of March, so that's another big constraint that may force us to go through more than a year, but when we move into the next phase of the project, we're going to be working all those details out and we'll come back and let folks know how long this project is actually going to take and how we're going to maintain traffic and how this project is going to impact traffic.

And with that, I'll take questions, comments. Raise your hand, I'll call on you and if you could state your name for the court reporter. Everybody take

a deep breath for a minute. I know it's a lot of information.

CELESTE SHERMAN: My name is Celeste Sherman. I am not a Machias resident. I'm from Machiasport. I have a question about some of the facts about the Dyke. First of all, it was not built by the town of Machias. The permission to build the Dyke was signed in 1865, and I'm trying to read, I've got a copy here, I'm trying to read it. We, the undersigned residents of Machias and Marshfield in the county of Washington owning marshlands lying on the margins and shores of Middle River so-called in said town, respectively ask that they may be incorporated by the name of Middle River Dyke Company and that they may be authorized and empowered to build and maintain a Dyke over tide waters to a said river from White's Point to so-called Machias to upland of the George Burnham or George Crocker on the eastern side of said river and at some point not exceeding a half-a-mile above the bridge, which crosses said river near its junction with Machias River. And they were given permission to build this in 1865. So the fact that you had it was built by the town, I believe you had, I'm not sure if that was clear, but it was done by private investors, to make that perfectly clear.

MR. WIGHT: Thank you for that information.

CELESTE SHERMAN: And in addition, you said that was a navigable water, you were brining up the fact, I mean, it doesn't sound like -- it's a moot point, but you have jurisdiction over navigable water, why would that be considered navigable water?

MR. WIGHT: That's a good question. I'm not sure I have the best answer for you. It's the navigational servitude law and I know our lawyers researched it somewhat. There's been case law in other parts of the country dealing with basically dams, dam removals, projects, anywhere where the water, the elevation changed and some cases it's blatantly obvious, okay, a boat could get through and in other cases boats can't get through.

CELESTE SHERMAN: But navigation sort of applies -- does it apply to commercial or just a row boat? I mean, is there a degree of navigation ability because that was marshland to begin with, so I think they had to pull ship up when they hit it up in the Middle River and pull it in on high flood tide and cover it up with brush. I don't think it's really navigable, is it?

MR. WIGHT: It could be. The legal

definition is could this be navigable.

CELESTE SHERMAN: Thank you. Those are all of my questions.

MR. WIGHT: Back here.

DON SPRANGERS: Quick question, Don Sprangers, East Machias. I'm wondering if the adjustable box culvert that you're proposing now, does that allow fish passage?

MR. WIGHT: It will allow water through and, you know, if the velocity is not too great, fish will be able to get through during part of the tide cycle. Ma'am?

VALDINE ATWOOD: I don't know if the people would want to hear, but at the last hearing I gave the history of this. Some of the things that you did in your presentation were not correct from what was -- from the documents of that time. If the group would be interested in hearing that presentation, I would be glad to do it. It would just take a few minutes.

MR. WIGHT: Any objections? Go ahead.

COURT REPORTER: Can I get your name?

VALDINE ATWOOD: Valdine Atwood. If I can come up there. The historic perspective of the Middle River Dyke, and it was called the Middle River

Dyke. The need for a short way to travel from Machias to points east had always been on the minds of the Machias residents. Travelers had to go by the road up around the settlement of Marshfield some five miles instead of being able to cross the several hundred yards across the river. First mention of constructing a Dyke over the Middle River appears in Machias town records of 1832. An 1835 map shows a toll bridge privately owned by the proprietors of the Machias Bridge, which had been incorporated February 5th, 1822 by an act of the Maine Legislature.

On several occasions articles published in the Machias Union and by acts on the Maine State Legislature, it was noted that the toll bridge had not been properly maintained, so in March of 1845 the town of Machias was empowered to purchase the bridge from the proprietors of the Machias Bridge. A July 1865 article in the Machias Union stated that the old toll bridge is up for repairs, travel via Marshfield or Machiasport. When the bridge is completed, notice will be given. So it appears that even after the town acquired the toll bridge, there continued to be problems with the this upkeep. In February of 1866 the State Legislature approved and gave authority to the town of Machias to erect a Dyke across the Middle

River.

In August of 1866 William Longfellow, a local contractor, whose ancestors herald back to the earlier settlers of Machias, including Morris O'Brien, Joe and Mary Burnham and through his grandparents, both of the Nathan Longfellows who fought in the Revolutionary War, offered to build the Dyke across the Middle River for the cost of $15,000. Longfellow traveled to Nova Scotia to investigate expenses of building and the materials used in the construction. He built a railroad wood with iron rails starting at the ground near the westerly end of the toll bridge to the eastern shore. A car was brought carrying dirt, stone, etc., and little by little, shovel full by shovel full for days and weeks until the old thoroughfare of the tides was closed. Problems were encountered, but in the end it withstood heavy winds and high tides and finally in July of 1868 the issue of the Machias Union, it was reported that the Great Dyke was about completed.

The Middle River was fed from springs, small ponds and lakes and reaches from Northfield to the Machias River forming a junction at the old toll bridge. The waters there was -- in the tide waters there was a saw mill, a grist mill and other machinery. When the tide was in, the waters covered an area not

less than 4 or 500 acres. Following the channel from the Dyke to the head of the tide water was judged to be a distance of about two miles. Besides there were numerous arms and inlets and other side of the main channel of considerable size. The Machias Union reported on August 18th, 1868, last Friday was one of the busiest days ever known on the celebrated Dyke. Standing on the bluffs overlooking the large territory, one could see 40 or 50 crews of men cutting the largest and most valuable crop of hay ever grown there estimated at about three tons per acre. The crop was heavy and the quality superior. The last and perhaps attributed to the big Dyke, which has secured out the salt water for the last six months.

There was other side advantages to the Dyke. In December 8th, 1868 issue of the Machias Union, it was reported that lively times on the skating rink above the big Dyke. A March of 1877 issue of the Union reported that Dyke Park is open to the public. The track was finished for persons and parties driving for pleasure and they were invited to the course. No toll or tariff, so the trotting speed could be tested and horses initiated at the Dyke Park. Again, in June of 1877 the Machias Union stated that parties driving for pleasure are invited to use the course. And I think

that's as far as we need to go with this, but it does show that the Dyke was built and has preserved the area.

MR. WIGHT: Thanks for that history. Yes, sir?

JOHN SPRAGUE: John Sprague, Marshfield. I have not been pleased with many things that the State has done locally here, what I'm talking about is the way they closed the prison and all of that, but I'm very pleased that they're deciding to fix the Dyke in kind. Thank you.

MR. WIGHT: In back?

TOM MICHAUD: Tom Michaud. I'd like to also thank the DOT for hearing owner's complaints or concerns from our first meeting as well as doing a thorough job in investigating this complex problem. I'd like to add a comment about fish passage. The fish passage with the current construction is not an issue of any kind. Fish pass regularly in the summer.

MR. WIGHT: Thanks for that comment. Going back.

JUDY EAST: Judy East. Two questions, one, what is the design duration here in terms of when will you come back the next time? We've gone from the 30s to 2020, so what are you planning for in terms of

the duration of this construction?

MR. WIGHT: Great question. Most modern structures, bridges or culverts, we design them for a very long life, generally at least 75 years, and we'd almost anticipate these structures may last a hundred years. We plan on using very high quality concrete and the reinforcing steel will be corrosion resistant. Reinforcing steel is most likely going to be stainless steel. The structure will be very durable.

JUDY EAST: So then follow up, are there any considerations in this construction to raising the deck and accommodating storms and sea level rise?

MR. WIGHT: As part of the feasibility study, we actually had a consult look at two or three different sea level rise scenarios and right now what we're looking at is -- let me go back real quick. Right now that we're thinking is sea level rise is a very challenging issue. We're going to consider it in our preliminary design process and we're going to look at probably several scenarios, but the problem for us is, you know, the Dyke Bridge is roughly in this neighborhood and purpose and need for this project is to provide a new durable structure with a high rating. Our purpose and need isn't to rebuild this whole thing. We're going to look at this issue and look at the pros

and cons and when we come back, we'll discuss that when we finalize our preliminary design. One fact we're probably going to design in the box culvert is that -- we're going to design it so that maybe three or four more feet of material can be put on top of it to accommodate a future change in the grade to accommodate sea level rise. I know the town has actually got a -- is doing some work looking into that issue of sea level rise and, you know, pending results of that study, you know, we'll see if we can work together, but as a minimum, you know, we'll at least make the structure able to down the road once they're finally, if the seas really do come up, it can be raised.

JUDY EAST: They really are coming up.

MR. WIGHT: I'm not going to fight you on that today. Gentleman in the blue hat.

IVAN HANSCOM: Yes, Ivan Hanscom from Marshfield. I'm 84 years old and I caught see run trout there when I was 12 years old and I caught another fish that looked suspiciously like salmon does today and there were stripers caught there just this year on the upside, so there is fish passage under your first proposal actually when you have no down there and I think you can get a lot of evidence and investigate it.

MR. WIGHT: I have a follow-up question, did you catch those right upstream or were they quite a ways up?

IVAN HANSCOM: Probably if you put your map up there, I can show you right where it was.

MR. WIGHT: Well...

AUDIENCE MEMBER: I wouldn't trust him. He doesn't tell the --

IVAN HANSCOM: Can you make it a little bit larger?

AUDIENCE MEMBER: You did state you was 84, right?

IVAN HANSCOM: That's right. You go up there at the end, see where there's a road that comes down through there with the shore, there's a little creek that comes in right there, right there and also up in that creek where there's an opening too. There's an old dam too. Actually if you go up in there, that has historic value, I'm sure.

MR. WIGHT: Thank you for that information.

IVAN HANSCOM: I may fish there this summer, if I catch one, I'll bring it up to you.

MR. WIGHT: Okay.

CHRIS SPRAGUE: My name is Chris

Sprague. I own the racetrack and I'm thankful for Section F that you talked about. A couple things, you talked about that the second plan with I think you said four gates and an adjustable gate that the increase in flow would be one point one feet, is that above what it is now?

MR. WIGHT: No, our plan is to into this little ponded area is to match what it is now. It goes up and down about a foot with the tide.

CHRIS SPRAGUE: One thing, over the last 20 or so years as this Dyke system has been failing, the water has been coming higher and higher. We used to be able to hay along that riverbank. I haven't been able to get out to where it was because the water has crept in so much. To me I'd like to see it get back to that level and I think that is still a viable option to do looking at numbers you had. I know different people want fish passage. I know, I don't know if Joe is here, is Joe Robbins here today? I know last time we had the meeting he talked about he caught salmon up in Middle River when he was a young boy and my point is when he did that, that clapper system closed completely. To me it sounds like fish need to have a handicap ramp to get up any place with water, has to have the tide pushing with it and to me if that's the

case, salmon could never get up over Machias River Falls because the tide doesn't come up high enough to allow them to come up in there. I feel as though fish get up in there even with the tide is out, water flows over the riprap of the stones that are there so fish get up through the gates when they're open and the tide flows. Granted they don't pass through there when the tide is high and the gates are closed, but still fish get where they need to get through the system. Thank you.

MR. WIGHT: Down here in front.

AUDIENCE MEMBER: I have a question, the third loop of the Middle River there, I believe is where my property goes back pretty much to the river, although not necessarily a hundred percent all the way. How much of that area is in flood plain you were talking about because that trailer you were talking about on 192 I think was cut out of what had been my property I think a long time back.

MR. WIGHT: Right this second I couldn't tell you what that number is. We could do some more leg work to figure that out, but big picture, we're not planning on restoring water upstream. We're going to maintain what's there now.

AUDIENCE MEMBER: I was more concerned

about the flood plain area that you had showed the slide about.

AUDIENCE MEMBER: Projected flood plain with the bridge.

AUDIENCE MEMBER: I mean, according to that it looks as though there's an awful lot of flat plain in the back.

AUDIENCE MEMBER: If they were to put the bridge.

MR. WIGHT: This graphic shows -- just to clarify, if we put a bridge down here --

AUDIENCE MEMBER: Okay.

MR. WIGHT: If the tide did whatever it wants to do, this is the rough area that's going to get inundated by the tide, but we're not doing that.

AUDIENCE MEMBER: I'll take a deep breath then.

MR. WIGHT: Thanks.

EDWARD PELLON: I'm glad he spoke about the last meeting in 2009. I was here too about the fish, about the salmon, there was only one, maybe two people that wanted to have the bridge. All the rest of the people here wanted to go back to the clappers. So my question to you is when you were considering a bridge, did you ever consider the additional cost of

Marshfield to increase the height of that bridge when it flooded up through there?

MR. WIGHT: Yeah, we did. The upstream bridge --

EDWARD PELLON: Is that part of your 2 million --

MR. WIGHT: The extra, the 4.5 million for the bridge option includes I believe almost two million to be with the upstream bridge, so there's that added cost.

EDWARD PELLON: Up in --

MR. WIGHT: Yeah, up in Marshfield.

EDWARD PELLON: We don't need it. We need it just the way it is right now.

MR. WIGHT: Could I get your name for the record, sir?

EDWARD PELLON: My name is Edward Pellon.

MR. WIGHT: Thank you. In the back?

TIM BEAL: Tim Beal. My name is Tim Beal. I grew up in Marshfield just up above there and we fished on the Middle River a fair bit. This was back in the '70s and early '80s. And I -- we caught a lot of brook trout in there and I have seen a change, it was probably in the '80s, of the amount of fish that

we caught that -- a lot of perch and chub came in. We caught most of the fish on the upper end of it and not much down below as well. And the other thing that I've seen, I've found down through there just in the past few years, and there's an awful lot of green algae that is almost choking out the river there and I was just wondering if there's any reasons for that or nothing like that's been addressed.

MR. WIGHT: Any of my environmental colleagues want to chime in on that?

JUDY GATES: It's usually an oxygenation issue when you get green algae. I'm Judy Gates with DOT's environmental office and that with the combination of water temperature and lack of circulation can create ideal conditions. Usually you'll see all blues and warmer, stiller water, so if it sits in there for a while, it's going to be conducive to that. That's my non -- it's my incomplete explanation.

MR. WIGHT: Thank you, Judy.

BOB WHITMAN: Bob Whitman, town of Marshfield. You mentioned the bridge over 192, it currently is in poor repair as it is and if you influx more water into it, you mentioned that you are going to do some more work on that, is that in your budget as

well? And secondly is if you put the clappers in down below and you sit there and build -- make it all better, will you be diverting traffic up through the Ridge Road in Marshfield around 192 or will there be another bridge, a temporary roundabout?

MR. WIGHT: The answer to your first question, because our plan down here is to basically replace it in kind, we're not going to be adding any more water, so we're not going to be making flooding up here any worse. So right now our plan isn't to -- we're not going to be working on the Stride Bridge on Route 192. The second question, how are we going to maintain traffic, that's basically we're going to figure it out during our next phase of the project. Giving this a little thought, this is a major route, Route 1, that's a lot of cars, you know, these roads around really aren't necessarily designed to handle another 9,000 cars. We're going to look real hard at doing our best to try to maintain traffic down on the causeway. One nice thing about the causeway between Route 1 and the parking, we've got a lot of width and we're probably going to be doing this project in stages and moving traffic side to side a little bit. So we're going to do our best to keep traffic impacts to the minimum and we'll be looking at that in more detail in

the next phase of the project.

BOB WHITMAN: The intersection in Marshfield where the Ridge Road comes down back onto 192, you really can't make a really sharp corner there with an 18 wheel truck and if you divert it onto the Church Lane area, it's even sharper and they can't handle -- they couldn't handle the traffic and the road wouldn't handle that much heavy loads going through there, so it's something else you've got to think about as well.

MR. WIGHT: Yeah, that's great comment. That's why we're really looking hard to keep traffic down here on Route 1. Yes?

DAVID DOWLEY: David Dowley. There's a number of interest groups in Machias that are working on a tide mitigation system, as I understand it, that would run from Bad Little Falls down to Helen's, which may also include a river walk and I'm wondering if the DOT would take into consideration that plan along with the plan -- if that plan actually materializes, with the finished worked that you would be doing on your Dyke project, in other words, to have a cross fertilization of ideas and conversations so that these two systems would work together harmoniously.

JUDY GATES: We're actually in the loop

on that project so we're keeping track of, you know, the ideas that are coming out of that and what might happen down the road for decisions on planning. So, we've got our eyes on it and that's about all we can do at this point.

JUDY EAST: Can I add to that? This is Judy East. There's a contract that the town signed with the Department of Conservation and Forestry for coastal money for funding that work, specifically requires that we coordinate with Maine DOT, so that is absolutely happening.

MR. WIGHT: Yeah, my next step in this project is to get them on board, once that team is on board, we'll do that outreach and coordinate our efforts.

I think I mentioned earlier, you know, if we build this structure, we're going to build it so that the road can be raised down the road.

GINNY BROWN: My name is Ginny Brown, Machias. To add to Bob Whitman's comment about using the back road to get through Machias, I'm sorry, through Marshfield, the same issue will be not being able to use Elm Street that could take you around down into Machiasport and around their bridge and back up because when you try to go around the corner of Elm

Street where the Bad Little Falls Park is, it's already there, so you don't want 9,000 more cars going that way, just so you know. And the second thing I would like to ask, and this might embarrass someone, but is it possible to have someone that could be very much impacted on this project be notified of different things because he is indeed a person that knows how to build bridges and could he take care of that one opening that you're going to have a regulator on?

MR. WIGHT: It's something we could talk about in the future.

GINNY BROWN: I'll give her his name later.

MR. WIGHT: Okay. Thank you. In the back?

CHARLES RUTALITCH: Charles Rutalitch and I live in Harrington and I work for the Sunrise County Economic Council. I noted that you had rated the condition of the current structure a four, but also that the construction timeline kind of at best case seems to be several years from now and we recently as a county had the experience of the breakwater in Eastport failing catastrophically. That really greatly complicated its reconstruction and this is actually a piece of infrastructure of similar importance to the

county's economy. Do you have any sense what the risk of catastrophic failure would be between now and 2020 or whenever construction could start under this timeline?

MR. WIGHT: My impression of this structure is any failure is going to be one you're going to see coming. It's not going to be a huge collapse, a car gets sucked in. You're going to see kind of settling, a pothole and something, you know, because there's so much width there, it's probably going to be an isolated failure, we just shift traffic over for a while and we push ahead with the project as quickly as we can.

CHARLES RUTALITCH: Thank you.

AUDIENCE MEMBER: The current condition of the pavement on the Dyke is in pretty poor condition. Are there any plans to do with anything with that before construction starts?

MR. WIGHT: Yeah, we drove it earlier in the meeting, there's some of this. Right now there's no immediate plans to do any paving on there and I can follow up with our paving folks when the next major paving on Route 1 is and try to find out when that is, but again, you know, we're just going to be focusing on probably a piece of the causeway when we're doing our

project.

AUDIENCE MEMBER: The other thing I'd ask, Mike, is that the Downeast Trail, the Sunrise Trail doesn't get lost in this as well. It's a really heavily used trail system and mitigation for that while the construction is happening is really important as well.

MR. WIGHT: Thanks for the comment. We're definitely going to keep that in consideration and try to keep that trail open, maybe a little narrower, but at least keep some sort of connection open during the project. Any other questions or comments? Don't be shy.

IVAN HANSCOM: I want to thank you folks for what appears to be using common sense approach.

MR. WIGHT: Can we get your name for the record again?

IVAN HANSCOM: Ivan Hanscom.

MR. WIGHT: Thank you. Over here?

GEARY ALBEE: Geary Albee, Marshfield. You showed on one of your slides the elevations of the tide and the current elevations of the property there, during the construction, was the elevation of the property going to be any higher to meet any future water problems from global warming or, you know, the

tide coming any higher, is it going to build it up any higher than 11 feet? I think that's what you showed there, about 11 foot elevation.

MR. WIGHT: The top of the causeway now is between 11 and 12 feet and as part of our project what it's going to be doing to the Dyke itself and 200, maybe 300 feet of pavement, we're not going to be raising the whole causeway.

GEARY ALBEE: Just the clappers.

MR. WIGHT: And one thing we are going to do when we put the culverts in, we're going to design them so the road can be raised later, so if the town does fund their project, address sea level rise, we can come in and work with the town and we can do something in the future.

GINNY BROWN: I just wanted to say one more thing. Ginny Brown, Machias. I would like to thank you for keeping the historical part of our town in as a major importance because from at least that same period of time when they built the bridge, they have always advertised Machias as Maine's Historical Town, so having the history, especially like the racetrack, is really important. Thank you.

MR. WIGHT: Thanks for the comment. Anybody else with a question or a comment? Don't be

shy. I guess with that, we'll close the formal part of the meeting. We'll hang around for a few minutes if anybody has a question and they want to come up and ask. Thank you very much for coming out.

(Concluded at 7:26 p.m.)

CERTIFICATE

I, Lorna M. Prince, a Court Reporter and Notary Public within and for the State of Maine, do herby certify that the foregoing is a true and accurate transcript of the proceedings as taken by me by means of stenograph.

and I have signed:

/s/ Lorna M. Prince
Court Reporter/Notary Public

My Commission Expires: February 6, 2019

Dated: April 9, 2018

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MAINE DEPARTMENT OF TRANSPORTATION

April 2, 2018 Preliminary Public Meeting
(originally scheduled for March 13, 2018
Dyke Bridge #2246
WIN #016715.00
Michael Wight, Project Manager

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MAINE DEPARTMENT OF TRANSPORTATION

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MAINE DEPARTMENT OF TRANSPORTATION

April 2, 2018 Preliminary Public Meeting
(originally scheduled for March 13, 2018
Dyke Bridge #2246
WIN #016715.00
Michael Wight, Project Manager

ATTENDANCE SHEET

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Topic	Stakeholder Comment	MaineDOT Response
Environmental	primarily concerned with adaptation to climate change	*No response requested.*
Environmental	First of all, thank you for putting this meeting together. I've watched the entire presentation and it was thoughtful and very clear. I have one immediate request and that is for copies of the alternatives tables that Tim presented. Also, is there an updated alternatives matrix from the one I already have (2018)? Thanks again and I look forward to working with you all throughout the public process and beyond.	I attached the alternative matrix slides from the public meeting presentation. We are working on a more refined and detailed matrix, similar to the 2018 version, that will include larger box culvert options. Hopefully, we can provide this new matrix by the summer. Please let me know if you have an additional questions.
Environmental, Road/Design, Flood Protection	Rising water levels with big tides show that there's a need for higher roadway, or bridge. Potholes and stretches of patched holes, leaves the driver unable to drive straight without causing excessive wear to ones vehicle.	*No response requested.*
Environmental, Right of way, Flood Protection	I am in support of options that will improve fish passage and address sea level change. Already storms with heavy rain and wind from the south have resulted in seawater flowing over parts of the causeway. This will become more common as sea levels are increasing. Allowing more tidal flooding upstream of the causeway will reduce the negative impacts of sea level rise in the downtown area. Of course this is frustrating for the landowners north of the causeway, but not only will be be compensated for the loss of land, but probably we will all benefit financially by reducing the impact of sea level rise on the town.	*No response requested.*

Topic	Stakeholder Comment	MaineDOT Response
Right of way, Road/Design, Flood Protection	This project was already discussed in length to repair and replace with clappers. That's is what the many people who signed the petition wants. That is what was to be done in 2020. The gates continue to deteriorate ans more and more land gets flooded. Farmers can't cut their crops. Fish passage happened when the gates were working properly. The historic race track was deemed a historic landmark. It cannot be flooded. The road bed is collapsing because the gates have not been fixed correctly. Middle river is not considered a vital atlantic salmon habitat. Two old dumps would be backwashed if the sea is allowed to return. Bottom line: The clappers need to be fixed now to stop current flooding and erosion of cribbing. In section 2: I want to select all four items. Why limit it to 3?	Good afternoon: Thank you for viewing the Virtual Public Meeting. There have been multiple reports of sea run fish on the upstream side of the dyke making it evident that some fish passage is available currently. It is unknown how large the window available for fish passage is during the tide cycle. Through consultation with the Maine Historic Preservation Commission, MaineDOT has identified the following historic properties within the Project Area (Area of Potential Effect): Machias Railroad Station - listed on the National Register of Historic Places Machias/Riverside Park Trotting Track - eligible for listing on the National Register of Historic Places While the track may be considered a local landmark, it is not on the list of National Historic Landmarks maintained by the National Park Service: https://www.nps.gov/subjects/nationalhistoriclandmarks/list-of-nhls-by-state.htm#onthisPage-19. MaineDOT will continue consultation and seek ways to avoid and minimize impacts to these historic properties. MaineDOT will consider the potential effects of each alternative, including the potential effects from flooding. If the project is found to have an adverse effect on historic properties, additional consultation and possible mitigation will be required. For more information regarding Section or to request official consulting party status, please contact MaineDOT's Historic Coordinator, Julie Senk, at Julie.Senk@maine.gov. MaineDOT is aware of the pavement settlement around Dyke Bridge. MaineDOT's bridge inspector made the following comment in the 4-28-2020 inspection: "The westbound and parking are sagged 8-12 over the bridge and previously patched, suggesting continued loss of fines through the timber culvert." MaineDOT is monitoring the pavement condition as part of the bridge inspections done every two years. In 2008, MaineDOT constructed a concrete slab over part of the bridge to minimize the loss of fine material (sand and/or gravel) through joints and openings in the timber culvert. We are also aware of the possibility of old dumps located upstream of Dyke Bridge. MaineDOT will investigate the possible impacts of additional flooding on the old dumps.
Environmental	Please tell me which studies are used to determine impact on fish? Don't get me wrong, I'm sure the culverts have some impact, I just believe it is minimal. We need a study to show us the truth. Too many opinions are being used to decide the impact on fish.	Thank you for viewing the Virtual Public Meeting. There will be multiple resources used when completing the biological assessment for the project, including studies found in the programmatic biological assessment and biological opinion. Those documents can be found here https://www.maine.gov/mdot/maspc/. The biological assessment is not due to be completed until later in the year.

Topic	Stakeholder Comment	MaineDOT Response
Road/Design	This is a much needed project. After many of years of neglect and little or no attention this area of our community has been allowed to deterioate to its present deplorable condition.The dyke is a focal point of our community and our local vendors and residents and should be prioritized over the needs of he Atlantic Salmon Commisssion.	*No response requested.*
Environmental	Other than replacing the entire dyke with a bridge, volitional fish passage may never be realized. But installing a structure that allows unrestricted tidal flow would allow fish to access the Middle River. Particularly river herring accessing habitat in Marks, 2nd Marks and six-mile Lakes. Do the presented maximum water level rises take into account sea-level rise predicted over the next 50 years? The drag bar below that asks what level of support I have for this project is hard to address. If the plan is to replace in kind then I have little support. If the plan is to improve fish passage then lots of support.	Good afternoon: Thank you for viewing the virtual public meeting. The landward water levels presented in the alternatives tables in the presentation and in the aerial flooding graphic only depict normal daily tide and river flows. They do not include storm tides, peak river flows, storm surge, or raises in sea level rise.
Environmental	an inkind or as close to inkind of this project is best for this area. As an effected land owner and sportsman I feel we need to look at more than salmon habitat and look at deer and other game wildlife habitat being effected by this project. A large percentage of deer and other large game are born, raised and or harvested from this area.	*No response requested.*
Environmental, Road/Design	It is very important to recover wetlands and improve fish passage, while maintaining vehicular and trail passage,	*No response requested.*
None Provided	The dyke is historic. Don't remove it. Climate change is overblown. Not Salmon habitat. Might physically appose the construction of a bridge (lay down in front of bulldozers)	Response provided via phone.

Topic	Stakeholder Comment	MaineDOT Response
Flood Protection	Will the high water impacts extend further north than the Middle river bridge on Rt 192? Will it affect the bridge on Ingalls Lane?	Thank you for viewing the virtual public meeting. Several of the alternatives presented at the meeting would restore tidal exchange at the Dyke Bridge on Route 1. These alternatives will impact the typical (daily) and storm surge tidal water levels at Stride Bridge on Route 192. The Middle River at Marshfield Flats Road is approximately 30 feet higher than the river adjacent to Stride Bridge. The Marshfield Flats Road and Ingalls Road bridges would not be subject to higher water surface levels from the potential restoration of tidal exchange at Dyke Bridge. Hope this answers your question.
Environmental, Road/Design	The dyke was constructed to encourage growth of grasses that were not as salt tolerant. In planning, we tend to think of restoring natural flows as a positive thing, but it would seem like after this long a time the loss of freshwater habitat needs a close look as part of the environmental study. The most reasonable alternative is likely one that mimics the existing leakage and/or enables incremental adjustments to be made gradually over time to allow for species response.	*No response requested.*
Environmental	Any alternatives restoring full tidal range need to consider the impacts on the Machias River sediment accumulation due to the current design. Restoration of tides without consideration of dredging Machias river would be contrary to the intent of environmental restoration.	Thank you for viewing the Virtual Public Meeting. MaineDOT intends to quantify the volume and composition of sediment in the Middle River landward of the Dyke Bridge that could be mobilized by the bridge and culvert alternatives. The analyses would evaluate potential impacts to the Machias River seaward of the Dyke Bridge.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	In the context of global climate catastrophe environmental concerns and flooding of are my greatest concern, I would not be satisfied with any of the alternatives that fall short of bridging. Frankly, I think the 700 ft span is inevitable but will only be implemented after the failure of whatever gets built next. There needs to be room for water to go (other than downtown, fish passage and salt marsh restoration, and increased access to middle river are welcome outcomes. Currently it is not possible to get into middle river from the public boat launch because of the tide gates. The only public access is a poorly developed and difficult hand carry on DCC property.	*No response requested.*
Environmental, Road/Design, Flood Protection	The replacement needs to be higher, let some fish through, provide space for parking and commerce, and limit the amount of water landward. That being said, this might be the only time landowners who will be affected by SLR to be compensated for moving into a non-flood zone.	*No response requested.*
Environmental, Road/Design	Thank you for the work the department has done to date, and for considering local needs and public comments. The return of full tidal flow to the Middle River should be considered a top priority for this project. A graceful span across the river would add to the natural beauty of downtown Machias. Parking should be maximized at each end of the bridge, while space for market stands maintained along its route. The racetrack, while historic, is not as important as restoring the migratory path of native fish species.	Thank you for taking the time to review the project materials and provide your comments. We are considering parking and safety in our alternatives analysis for all the alternatives presented at the meeting. However, the bridge options may not have parking on the structures due to the resulting expanded width and how that would affect constructability, future maintenance, construction cost, and public safety.
Environmental, Road/Design	I would like to see an open span bridge installed at the machias dyke location. I feel that the current situation (lack of significant agriculture) does not supersede the environmental that would be realized by the installation of a bridge.	Thank you for viewing the virtual public meeting. Your participation is appreciated. Your comment will be considered as we continue to review alternatives for the Dyke Bridge.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Flood Protection	I feel that this region of the state needs to restore migratory fish populations back to close to historical levels. Finding an alternative to the dyke system as it exists now is critical. We also must adjust of infrastructure to anticipate sea level increases and storm impacts. Also I would like to see the flea market have its own space away from the lanes of traffic.	Thank you for taking the time to review the project materials and provide your comment. The relocation of the community flea market away from the Route 1 causeway is a local decision and not within the scope of the project. However, we will be examining potential safety improvements to improve the current parking condition.
Environmental, Flood Protection	My primary concern is that fish passage by itself is not sufficient unless the ecology of the upstream marshes is allowed to return to one that is primarily an estuary, not a fresh water river. In other words, I believe that it is necessary to allow a significant amount of tidal flow to pass above the current dyke and for sediments that have been deposited since the dyke was built to be flushed out, allowing not only fish passage, but restoration of the ecology that supports the fish populations. I recognize that this approach increases flood risk and cost, but not doing so reduces the likelihood of improving Atlantic Salmon restoration efforts.	*No response requested.*
Environmental, Flood Protection	Clearly a non spanning bridge creates more trouble with higher cost. Alternatives 2-4 seem to be in the best balance, at the current time with the information presented. What wasn't made clear was the balance of Landward aquatic species and Atlantic salmon/saltwater. Neither were flood predictions presented graphically in an attempt to predict flooding on the landward side for environmental/landowner/recreation purposes.Given perhaps some missing critical estimations/predictions it is not completely understand full impacts and best direction.	*No response requested.*

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	In keeping with the goal of restoring salt marsh health and full fish passage to the site, it is clear that one of the bridge span options is best, and undoubtedly not the smallest of those proposed. Clearly, the crossing needs to be replaced, so I am not opposed to the project, but would be strongly opposed to the continued limitations to natural tidal exchange presented by gated culverts or other culverts not allowing for relatively natural and full tidal exchange.	*No response requested.*
None Provided	open span structure is the only way to go if fish migration is to be considered	Thank you for viewing the virtual public meeting. Several open span structure alternatives are being considered to enhance fish migration. We recognize that open span options are the alternatives that likely allow the most opportunity for fish passage. However, alternatives that include culverts and variations of tide gates are also important to analyze to meet some of the secondary project goals. All options are also being weighed for increases in landward water levels, potential for transport of deposited sediment from the area landward of the dyke, and several other factors.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design	The importance of this project to the communities of Washington County can not be understated. I hope the state will understand the impact this project will have, and hopefully, it can be a positive one. With impending sea level rise, this factor has to be at the forefront of plans and design. To do anything less in order to save costs would be flat-out stupid and short-sighted. In addition, an open, bridge-design should also be paramount to this project in order to allow for anadromous fish passage, wading bird habitat, and the protection of the salt marshes in Middle River. Maine is losing it's salt marshes at a rapid rate, and we don't need to lose more by human error or as a money-saving function. If you've driven the roads in Washington County, you'll know that there is an improper allocation of road funding to our region. I get - we don't have enough people up here to move the needle in Augusta (see the Route 1 stretch in East Machias, which should be criminal!), but this bridge infrastructure project is critical to the local economy and environment. Please don't scrimp and save and create a design that will need to be re-examined in 20 years. Build a raised, open bridge that will have a lasting positive impact, well into the future. Thank you for your time.	*No response requested.*
Environmental, Road/Design	I THINK THAT THE INTERESTS OF THE PEOPLE MACHIAS AND THE STATE OF MAINE ARE BEST MET BY REPLACEMENT OF THE dyke WITH A SPAN BRIDGE.	*No response requested.*
Flood Protection	What is the scope of the project?	Thank you for viewing the virtual public meeting. The scope of the project is rehabilitation or replacement of the Dyke Bridge. The various alternatives are presented in video #3: Alternatives Presentation.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	Thank you for the presentation. This is superior to doing it all in person. Great preliminary for in person meeting. Thank you. Enjoyed all presenters. Kristen Chamberlain needed full volume to be heard; initial audio too low. I appreciate all the parameters considered and the cost implications for the bridge/dyke and attendant property impacts. Can't comment on much of that w/o knowing what Machias is planning to do w/ dyke and sea level rise. I favor a solution w/ full fish passage, advection and volitional, and a good view of the surrounding river and marshlands.	*No response requested.*
Environmental, Road/Design, Flood Protection	Please keep me updated as the project continues, thank you	*No response requested.*
None Provided	I'm pretty sure that my comments didn't get upload but it's an impressive and clear description of the issues, process and options. We'd like to simply be on the record strongly in favor of the full span bridge options because of its value for fish passage and ecological health. We support restoring the site's the natural hydrologic functions, and believe this can have great benefits for migratory fish species. That's it!	*No response requested.*

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	As I see it, the alternatives that fit with the Town's project, that improve fish passage, and withstand sea level rise achieve most of the goals listed. The alternatives that are most interesting to me are bridge or many culverts that are open all the time. Advection level fish passage is a minimum option in my view. Replace-in-kind is an unacceptable option. Why not more than 4 culverts that are open all the time? Couldn't a design with more open culverts achieve volitional fish passage without building an expensive bridge? Why were the 2 sea level rise scenarios chosen, why not include a larger sea level rise? What is the projected lifespan of culverts versus the lifespan of a bridge? Will there be movement of sediment with more water moving up Middle River, and what would the consequences of that be?	Thank you for viewing the Machias virtual public meeting. Project studies have identified that providing volitional landward/upstream fish passage with culverts would require hydraulic capacity similar to the hydraulic capacity of a bridge. Construction of a large number of culverts would not necessarily be less expensive than building a bridge at Dyke Bridge due to complex subsurface conditions with timber cribbing and boulder infill and tidal exchange through the causeway itself that greatly complicates dewatering to work in the dry. The Sea Level Rise (SLR) scenarios were selected in accordance with Maineâ€™s Climate Action Plan developed by the Maine Climate Council. The Scientific and Technical Subcommittee recommends the State commit to manage for 1.5 feet of relative sea-level rise by 2050 and 3.9 feet of relative sea-level rise by 2100. The Plan, entitled Maine Won't Wait, A Four-Year Plan for Climate Action, can be found here: https://www.maine.gov/future/initiatives/climate/climate-council/reports Highway structures such as bridges and concrete box culverts are designed for a 75-year design life. Culverts generally require less maintenance than bridges. MaineDOT intends to quantify the volume and composition of sediment in the Middle River landward of the Dyke Bridge that could be mobilized by the bridge and culvert alternatives. The analyses would evaluate potential impacts to the Machias River seaward of the Dyke Bridge.

Topic	Stakeholder Comment	MaineDOT Response
None Provided	Questions -- so, if the Machias project were decided to be a bridge, where would the bridge portion begin? Would it be on either side of the river, maybe starting by the current dyke? I ask because someone with the town though there would be a place for vendors still, but I believe you said no, the bridge can only carry trail and Route 1 traffic. Second - the town is talking about supporting a bridge idea IF the state would dredge the Machias and Middle Rivers both to improve fish habitat and reduce flooding. Is that a possibility?	*Question received and responded to via email.*
None Provided	I appreciate the work you're putting into the Machias dyke/Bridge project and thank you. In addition to US Rt 1, Calais Branch Rail Corridor, and the Down East Sunrise Trail, the levee is also part of US Bike One and the East Coast Greenway stretching from Key West, Fl to Calais. Mentioning that might help generate interest and maybe, (just maybe), help w/ funding.	Thank you for viewing the Machias virtual public meeting. Good point about the East Coast Greenway. I will keep that in mind for future presentations.
None Provided	I'm a reporter with County Wide News in Machias. I have CC'd a publisher in this email. I am developing an article about the Machias Dyke-Bridge project. I viewed the introduction and alternatives' videos on this project's "virtual public hearing" pages this afternoon and took copious notes. Are there printed documents, either PDFs or Doc files, available for each of these videos? If so, where can I find and download these documents? Thank you very much for your consideration.	*Question received and responded to via email.*
Environmental	I would favor a response (bridge or large, open culverts) that makes significant progress toward restoring fish passage and a more natural tidal regime north of the road.	*No response requested.*

Topic	Stakeholder Comment	MaineDOT Response
Flood Protection	We would appreciate consideration to limit tidewater entering the dyke as much as possible.	*No response requested.*
Environmental	Allowing adequate and free flow from the sea into the estuary is vital to the health of the Middle River and to all of the anadramous/catadromous fishes that reside there.	*No response requested.*
Environmental	There are several concerns. The SMELL! Better water circulation throughout the wetland is needed (in my view) the tides and currents in that area would probably help with this IF the bridge portion of the dyke was large enough to allow more water to enter the wetland, and exit in low tide condition. Also the wild life would profit. The wetland is right now de facto cut off from the river, the existing opening does not allow fish to pass through in those numbers that would enhance the spawning within the wetlands, and other wildlife. As for the public area in the widened road across the dyke I believe it is also of vital interest to the people in and around Machias as it is a reason for out of state and local people to stop the car for a while, shop, decide to go to a restaurant nearby, etc. This is of VITAL INTEREST. AND not getting overwhelmed by the foul stink of sludge deposited by the sewage treatment. A small park across from Helen's with lawn area, benches and trees with nice NATURAL landscaping (not cement and blacktop) would invite people to take a break from driving and stay in town for a bit. The flea market needs to be enhanced, and not regulated to death. People want to see NATURAL ORGANIC type of things and events.	*No response requested.*
Road/Design	I only wish to emphasize/request that the new Dyke continue to provide Flea Market space for our community.	Thank you for viewing the Machias virtual public meeting. The relocation of the community flea market away from the Route 1 causeway is a local decision and not within the scope of the project. However, we will be examining potential safety improvements to improve the current parking condition. However, the bridge options may not have parking on the structures due to the resulting expanded width and how that would affect constructability, future maintenance, construction cost, and public safety.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design	I believe strongly that restoring the Middle River and it's salt marsh has to be the highest priority. The benefits that will come from restoring anadromous fish to the Middle River should not be squandered. I support any of the bridge options. Option 10 would be fine if the cost becomes a driving concern.	Thank you for viewing the Machias virtual public meeting. The primary purposes of the project are to improve the condition of the Machias Dyke Bridge and to preserve the Calais Branch Rail Corridor. Other secondary goals of the project include improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may result from increased tidal exchange.
Road/Design, Flood Protection	Build a bridge because the dyke keeps flooding	*No response requested.*
Environmental, Flood Protection	Totally concur with allowing fish passage - preferably volitional. Would hope the planning would be VERY forward thinking regarding sea level rise. Get rid of the clapper gates. Thinking you should go with a bridge alternative.	*No response requested.*
Environmental, Road/Design	Please keep the Dyke intact.	*No response requested.*
Right of way, Road/Design	We request that any design or structure to replace the causeway contain a 10 ft wide off road path to accomidate The Downeast Sunrise Trail which presently uses the right of way of the Calais line rail road which crosses the estuary on the existing causeway. This path should line up verticlly and horizontally with the R)W at both the eastern and western ends of the new structure.	Thank you for viewing the Machias virtual public meeting. The Calais Branch Rail Corridor is preserved under the State Railroad Preservation Act. All alternatives presented at the meeting accommodate the Calais Branch Rail Corridor and the associated Downeast Sunrise Trail.

Topic	Stakeholder Comment	MaineDOT Response
Environmental	I'm a property owner directly on middle river. I would stand to lose a substantial amount of pr operty if the flappers were to be replaced with a bridge and/or bridges. The bridge would floo d our meadows out of existence. Generationally owned land and working farms that supplies h ay and grass fed beef to many will be lost. Grass is a rare commodity in this area, it is a traditio nal heritage that has been in existence since shortly after the civil war. The dyked grasslands ar e written about in a book called â€œagriculture of Maine 1869â€. The settlers of this land cam e here for the harvest of hay and we are currently still harvesting that hay in 2021! Local busine sses depend on our dyke hay to sustain their businesses. There are very very limited supplies of this type of hay anymore, and yet here we are, still harvesting it. The thousands of bales of dyk e hay that we harvest each year is used for a variety of purposes such as covering on local blue berry lands and covering for new job sites as well as sold to a local hardware store and also sold to local farmers. This grassland has supported some of the best deer populations in Washingto n county. We have personally harvested many deer on our property. Every spring we watch a variety of migratory birds return and nest their babies here. This is more than a transportation issue, this is more than a fish passage issue. This is a property rights, traditional use and food s ecurity issue. What is EPA going to do when the salt water reaches the old Machias landfill and all the pollution starts leaking out? According to your design, the water will definitely reach the landfill, I canâ€™t imagine the junk and pollution that will seep out when this happens. What is going to happen if you open up middle river and the sediment that has been laying here for hu ndreds of years flows out into Machias river and the ocean? What sort of pollutants will that ca use? Our family has fished the middle river for many many years. We have seen elver eels, Stri ped bass, salt water trout and other salt water fish swim up this river and continue to do so. W e have a pond on our property and the eels make their way to our pond annually! Clearly the c urrent, dilapidated flappers are still allowing some fish passage, imagine how much better the p assage would be with better and improved flap gates. When this plan was originally present a t UMM years ago, there was mention that the wet lands of Maine were being depleted in south ern Maine and therefore wetlands needed to be restored in other areas of the state to try to ev en the score. Is this another example of us paying the price for southern Maineâ€™s issues? Is the damage of hundreds and hundreds of acres of woodland, farm land, hay land, hunting, migr atory land and personal property really worth trying to sustain a salmon population that isnâ€™ t even currently sustainable in the Machias river anyway. If a large, striped bass can make its w ay up the old flappers, then it stands to reason that a salmon could as well! The salmon argume nt doesn't justify this bridge proposal. For all the reasons Iâ€™ve listed, and many more, we pr opose that the flappers be safely replaced. We do NOT support the needless construction of a bridge and/or bridges, that will waste so much money, ruin properties and change the way of li fe for not just us, but for all the community.	Thank you for viewing the Machias virtual public meeting. MaineDOT is aware of the potential inundation of land, including agricultural land, upstream from Dyke Bridge that may result from increased tidal exchange. The secondary goals of the project were developed to balance the competing needs of the transportation ass et including improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may resul t from increased tidal exchange. These alternatives and potential changes to water levels will be explored further as the study progress es. If necessary, we will work with property owners to compensate for substantial impacts after we have identified a preferred alternat ive and the environmental review is complete. MaineDOT intends to quantify the volume and composition of sediment in the Middle River landward of the Dyke Bridge that could b e mobilized by the bridge and culvert alternatives. The analyses would evaluate potential impacts to the Machias River seaward of the Dyke Bridge. We understand that there are different opinions on the critical nature of the Middle River/Machias River for Atlantic salmon; howeve r, the both rivers are officially listed as Critical Habitat for Atlantic salmon and are afforded certain regulatory protections. â€¯â€¯The cr itical habitat listing can be found here: https://www.fisheries.noaa.gov/action/critical-habitat-gulf-maine-dps-atlantic-salmon MaineDOT is aware of the possibility of landfills and other waste disposal sites located upstream of Dyke Bridge. The study will inve stigate the possible impacts of additional flooding on landfills and other waste disposal sites. Transportation projects often result in unavoidable impacts to wetland and the functions and values they provide. State and federal wetland regulations require mitigation, which refers to a project or effort to restore lost functions and values (e.g., fish and wildlife ha bitat, water quality improvement, etc.). There are several tools MaineDOT and other developers use to provide mitigation when it is re quired. Sometimes wetlands can be restored, enhanced, or created close to the project area. In some cases, wetlands can be restored, enhanced, or created off-site but within the same region. Maine also has the Maine Natural Resources Compensation Program (MNRCP), which allows applicants to pay a fee for wetland impa cts. The funds are managed by DEP and the Nature Conservancy and put towards projects that create, enhance, restore, or preserve re sources in the same region as the impacts. Wetland mitigation banking refers to an effort to complete wetland restoration, enhanceme nt, creation, or preservation project not associated with a development project to obtain â€œcreditsâ€. The credits are put into a bank available for use or purchase to meet regulatory mitigation requirements for future projects that are located in the same geographic re gion. MaineDOT is not currently pursuing wetland mitigation bank sites. MaineDOT is not considering banking of any wetland creation that may occur from increased tidal exchange. The Machias Dyke Bridge project will require review of all potential natural resource impacts . Project-specific mitigation, if it is required for the preferred alternative, will need to occur in close to the project area (for example, sit es in the immediate vicinity or in the same watershed). There have been multiple reports of sea run fish on the upstream side of the dyke making it evident that some fish passage is availabl e currently. It is unknown how large the window available for fish passage is during the tide cycle. Currently all options are under consideration. However, in September 2020, MaineDOT received comment from the National Marine Fisheries Service (NMFS). The NMFS administers the Endangered Species Act for Coastal Species as well as other laws that guide marine conservation and management. NMFS stated that the agency had substantial concerns about the in-kind replacement alternative statin g that it would provide even less opportunity for fish passage than exists now and would likely have detrimental effects on physical and biological features of critical habitat for Endangered Atlantic salmon. The Endangered Species Act requires federal agencies to ensure t hat their actions do not jeopardize the continued existence of any listed species. Actions may not destroy or adversely modify any desig nated critical habitat. In response to these comments, MaineDOT and FHWA are re-considering alternatives that include options to im prove fish passage.
Environmental, Right of way, Road/Design	It is to bad that the plan agreed upon in the past is still not valid.	*No response requested.*
Environmental, Right of way, Road/Design	Please make certain that Dyke flea-market availibility is maintained !	The relocation of the community flea market away from the Route 1 causeway is a local decision and not within the scope of the project. However, we will be examining potential safety improvements to improve the current parking condition.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Flood Protection	Keep the dyke, and fix the clappers to save 300 acres of grassland that is grazed by local farmers and good deer habitat.	MaineDOT is aware of the potential inundation of land, including agricultural land, upstream from Dyke Bridge that may result from increased tidal exchange. The secondary goals of the project were developed to balance the competing needs of the transportation asset including improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may result from increased tidal exchange. These alternatives and potential changes to water levels will be explored further as the study progresses. If necessary, we will work with property owners to compensate for substantial impacts after we have identified a preferred alternative and the environmental review is complete.
None Provided	Would full tidal restoration of the Middle River provide flood protection for downtown Machias?	Responded via phone. We discussed that Current Federal Emergency Management Agency (FEMA) flood hazard information indicates that the base flood elevations (BFE) is at a NAVD88 elevation of 11 feet (ft) in the Middle River landward (upstream) from Dyke Bridge and at an elevation of 10.7 ft in the Machias River seaward (downstream) from Dyke Bridge. Information developed by FEMA indicates that these BFEs were developed using detailed study methods. FEMA flood hazard mappings suggest that flooding in downtown Machias results from high water surface elevations in the Machias River seaward from Dyke Bridge and full tidal restoration in the Middle River is therefore not anticipated to provide flood protection to downtown Machias. Higher flood elevations in the Machias River due to sea level rise would result in increased flood risks to downtown Machias regardless of future actions at Dyke Bridge.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design	PLEASE, do not destroy the grassland, farms and property by taking out the dyke and building a bridge or any other structure that will flood the meadow. People raise cattle, hay there and have since 1866. It is some of the best deer habitat in Washington Co. PLEASE build up and refurbish the dyke and install good functioning clappers. This is our heritage in this area. Do not destroy a way of life. Middle River has never been more than a nominal Atlantic salmon stream and at that the few young fish in there were able to negotiate the clappers when they were working properly. Also searun brook trout and striped bass. I spent 28 years protecting salmon and would love to see them thriving but the reality is despite millions of dollars poured into their management they continue to decline. The Machias and East Machias rivers are true salmon rivers right nearby, the fish have those. When we electro fish we find young salmon in many little brooks in the area. This does not make them potential salmon runs. Grass is a precious resource in this area. It allows us to produce food for local families in the area. Thank you.	MaineDOT is aware of the potential inundation of land, including agricultural land, upstream from Dyke Bridge that may result from increased tidal exchange. The secondary goals of the project were developed to balance the competing needs of the transportation asset including improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may result from increased tidal exchange. These alternatives and potential changes to water levels will be explored further as the study progresses. If necessary, we will work with property owners to compensate for substantial impacts after we have identified a preferred alternative and the environmental review is complete. We understand that there are different opinions on the critical nature of the Middle River/Machias River for Atlantic salmon; however, the both rivers are officially listed as Critical Habitat for Atlantic salmon and are afforded certain regulatory protections. The critical habitat listing can be found here: https://www.fisheries.noaa.gov/action/critical-habitat-gulf-maine-dps-atlantic-salmon
Environmental, Road/Design, Flood Protection	I strongly encourage the DOT to choose Alternative 10A because it satisfies both the ecological issues (fish passage, sediment transport) and the societal issues (vendor parking and coastal resilience).	*No response requested.*
Environmental	The DOT must address the passage of endangered Atlantic salmon under Section 7 of the Endangered Species Act, as amended. Only alternatives that allow for volitional fish passage adequately address this. Alternative 10A or 11A should be selected.	MaineDOT and our federal partners have had multiple discussions regarding the Endangered Species Act and the Machias Dyke project. The department will continue to explore methods to improve fish passage through the structure. We understand that Endangered Species Act consultation is very important in the direction of the project.

Topic	Stakeholder Comment	MaineDOT Response
Right of way	All affected landowners for this project are contesting land that is located within the FEMA 100-yr floodplain of the Middle River and, therefore, have no standing in regard to the project outcome, other than being compensated at fair-market value. If you own land in a floodplain, you should not be surprised when it floods. It is time to restore the full tidal flows to the river. Please select Alternative 10A or 11A.	*No response requested.*
None Provided	I wanted to send you an email regarding the plans for the Machias dyke replacement. I want to voice my opinion on the mater. This project will DIRECTLY effect me as a commercial property owner; along with many of my family, friends, and neighbors. I am requesting the DOT to remove and REPLACE the Machias Dyke floppers! Installing a bridge in this location will DRASTICALLY/ NEGATIVELY effect my property. I have worked hard to purchase this property and business here in and I would be overjoyed to not lose 1/4 minimum of what land I do have here. The bridge proposal does not make sense to me. I believe it is best for the community if the floppers are to be replaced as they are and have been for many, many years. Installing a bridge will immediately and adversely effect thriving habitats such as: Marsh Land/ Hay Fields/ Fish Habitats/ Migratory Bird Habitats/ Livestock Pastures.. just to name a few. Between myself and my parents, we would lose 20-30 acres of land at the minimum. This is land that provides local people with hay for their livestock. I believe it is a direct threat to my town and its people if a bridge is installed in the Machias dyke! Please consider my thoughts on this matter, there are hundreds more reasons I could give you in an argument AGAINST the bridge proposal. The rising of Middle River would threaten many homes with flooding in the rainy months! This bridge would turn our beautiful marshlands in the center of Machias into dirty stinky tidal mud flats! The Machias sewer plant is within a few hundred yards of where the water would rise! I believe the Machias Dyke Floppers have been doing their job and doing it well for the past many years. If the state so chooses to repair/ replace them, I believe that would be the best possible outcome for all the wonderful people of Machias and Marshfield. I look forward to hearing from you and speaking with you more about this matter.	MaineDOT is aware of the potential inundation of land, including agricultural land, upstream from Dyke Bridge that may result from increased tidal exchange. The secondary goals of the project were developed to balance the competing needs of the transportation asset including improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may result from increased tidal exchange. These alternatives and potential changes to water levels will be explored further as the study progresses. If necessary, we will work with property owners to compensate for substantial impacts after we have identified a preferred alternative and the environmental review is complete. Currently all options are under consideration. However, in September 2020, MaineDOT received comment from the National Marine Fisheries Service (NMFS). The agency administers the Endangered Species Act for Coastal Species as well as other laws that guide marine conservation and management. NMFS stated that the agency had substantial concerns about the in-kind replacement alternative stating that it would provide even less opportunity for fish passage than exists now and would likely have detrimental effects on physical and biological features of critical habitat for Endangered Atlantic salmon. The Endangered Species Act requires federal agencies to ensure that their actions do not jeopardize the continued existence of any listed species. Actions may not destroy or adversely modify any designated critical habitat. In response to these comments, MaineDOT and FHWA are re-considering alternatives that include options to improve fish passage.

Topic	Stakeholder Comment	MaineDOT Response
None Provided	Thank you for the response. I understand your agency must be compliant with the Endangered Species Act. My concern is this: how can NMFS have substantial concern with an in-kind replacement when the dyke has been existing in peace with its floppers in place for hundreds of years? All the while, allowing healthy runs of salmon and sea run trout? I have lived on this river all my life. I have caught many native fish here. I am concerned with the negative effect substantial rising salt water will have on their habitat? How will it effect these fish and their habitat when the spring time waters rise too close to the Town of Machias Dump Landfill? I believe the risk to the people of Marshfield and the risk to the fish population and habitat are much higher with a new bridge installation! How about installing a fishway along with new floppers? That sounds like a much better compromise to all involved, without destructive/negative impacts on landowners who would rather keep their land than "be compensated for lost property". I, myself, am not willing to lose 3/4 of my property. I sincerely hope we can find a common solution. I know many others like myself that will not willfully allow this mass loss of property.	I understand your concern with the alternatives that restore varying levels of tidal flow. However, NMFS considers the Middle River historical critical habitat for Atlantic Salmon. We will continue consultation with NMFS as we review all alternatives. MaineDOT is aware of the possibility of landfills and other waste disposal sites located upstream of Dyke Bridge. We will investigate the possible impacts of additional flooding on landfills and other waste disposal sites. Finally, installation of fish ladders (technical term is "fishways") was are not being not evaluated as a component of the evaluated alternatives at Dyke Bridge. Previous project studies identified that design and operation of a fishway at Dyke Bridge was not practical due to regular variations in water surface elevations seaward and landward from Dyke Bridge and range of swimming capabilities for fish species that could be targeted for upstream passage. Project Previous studies did also evaluated whether "fish-friendly" self-regulating tide gates (SRTs) could be a potentially feasible alternative to manage flow and water levels while providing upstream fish passage. It was determined that SRTs, including fish-friendly SRTs, were not feasible at Dyke Bridge.

Topic	Stakeholder Comment	MaineDOT Response
None Provided	If you look at the tax map I have highlighted my property. Since I have a stake in this project I would like to recommend my choice. I would like to see one that has an open tunnel for migratory fish with far less water depth open full tide. I thought that there already fish ways, they should have already been there. Look at the Columbia river in Washington at the fish ladders, maybe we could do something similar Since this dyke system has been in place for 150 years I am concerned about erosion and the actual depth the river will normally be flowing in terms of inside or outside the current banks, since I have a dock down there that I fish from. One other question is how does brine and/ or brackish water have on beavers and other mammals and birds living there now? My choice would be either option 8 or option 9 or which ever is the partially gated culverts. Hope we can work this out for both the animals here now and the migratory fish.	Currently all options are under consideration including alternatives that combine culverts with tide gates and culverts without gates (2019 Alternatives 2, 3 and 4) to provide for fish passage. Installation of fish ladders (technical term is "fishway") was are not being not evaluated as a component of the evaluated alternatives at Dyke Bridge. Previous project studies identified that design and operation of a fishway at Dyke Bridge was not practical due to regular variations in water surface elevations seaward and landward from Dyke Bridge and range of swimming capabilities for fish species that could be targeted for upstream passage. Project Previous studies did also evaluated whether "fish-friendly"" self-regulating tide gates (SRTs) could be a potentially feasible alternative to manage flow and water levels while providing upstream fish passage. It was determined that SRTs, including fish-friendly SRTs, were not feasible at Dyke Bridge. The introduction of saline water may have an effect on the wildlife using the marsh currently. The saline water is likely to cause some changes in vegetation community, which in turn is likely to cause some changes in wildlife uses. The introduction of more sea run fish may also attract different bird species to the area. Beavers generally live in freshwater habitats; however they are able to survive in salt water.

Topic	Stakeholder Comment	MaineDOT Response
None Provided	Mr. Howard, I am writing to express my concern about the potential of MDOT replacing the Machias dyke with a bridge. It is my opinion that there is no reason the floppers cannot be replaced and other repairs made rather than putting in a bridge that will destroy homes and farmland. Perhaps this seems like an easier option for the MDOT, but it is significantly more costly to the taxpayers and very destructive to the town of Machias. This destruction reaches all the way into pastureland in Marshfield. It destroys homes, as you are surely well aware. It serves no purpose. Please stop the bridge proposal and move forward with a plan to replace the existing floppers to keep the Machias dyke in place.	Currently all options are under consideration. However, in September 2020, MaineDOT received comment from the National Marine Fisheries Service (NMFS). The agency administers the Endangered Species Act for Coastal Species as well as other laws that guide marine conservation and management. NMFS stated that the agency had substantial concerns about the in-kind replacement alternative stating that it would provide even less opportunity for fish passage than exists now and would likely have detrimental effects on physical and biological features of critical habitat for Endangered Atlantic salmon. The Endangered Species Act requires federal agencies to ensure that their actions do not jeopardize the continued existence of any listed species. Actions may not destroy or adversely modify any designated critical habitat. In response to these comments, MaineDOT and FHWA are re-considering alternatives that include options to improve fish passage. MaineDOT is aware of the potential inundation of land, including agricultural land, upstream from Dyke Bridge that may result from increased tidal exchange. The secondary goals of the project were developed to balance the competing needs of the transportation asset including improving fish passage through the structure and minimizing inundation of land upstream from Dyke Bridge that may result from increased tidal exchange. These alternatives and potential changes to water levels will be explored further as the study progresses. If necessary, we will work with property owners to compensate for substantial impacts after we have identified a preferred alternative and the environmental review is complete.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	From: Downeast Coastal Conservancy April 29, 2021 Subject: Rehabilitation and Replacement Of Machias Dyke Bridge Downeast Coastal Conservancy is a nonprofit, tax-exempt land trust based in Machias, Maine. It has been active in coastal land conservation in Washington County for over 30 years. DCC has more than 350 members and owns more than 40 conservation preserves in the county, including Middle River Park in Machias that has significant shore frontage on the Middle River near the current dyke bridge. DCC strongly believes that a replacement of the current dyke bridge must be designed to allow free fish passage up stream on the Middle River for diadromous fish such as Atlantic salmon, smelt and alewife. The Middle River is in designated critical spawning and rearing habitat for the endangered Atlantic salmon. Fish passage on the Middle River was historically in place and should be restored with the necessary tidal flow. Restoration of fish passage is important and has been supported by MDOT in other Maine locations. It should be supported in Machias as well. Downeast Coastal Conservancy	*No response requested.*
None Provided	I am a home owner In Machias and we do NOT want a bridge built. Keep the dyke, and fix the clappers to save 300 acres of grassland that is grazed by local farmers and good deer habitat. Lots of local vendors use the dyke to sell their goods as well. We need that space and the land that a bridge would ruin.	Thank you for viewing the Machias virtual public meeting. The relocation of the community flea market away from the Route 1 causeway is a local decision and not within the scope of the project. However, we will be examining potential safety improvements to improve the current parking condition.

Topic	Stakeholder Comment	MaineDOT Response
None Provided	I spoke with a stakeholder by phone on 4/28/2021. He had my phone number from the 2018 public meeting. He wanted to know if MaineDOT was moving ahead with the replacement in kind alternative. I told him that MaineDOT is now investigating a range of alternatives including bridge replacement alternatives that would return tidal flow upstream. He asked why MaineDOT was not going ahead with replacement in kind. I told him that MaineDOT received a letter from the environmental regulators with serious concerns about replacement in kind. He preferred replacement in kind and wanted to protect his property for flooding. He cuts hay on his property, which is located on the west side of the Middle River. He said his wife did put a lengthy comment on the public meeting website for this project. He said he did not get a post card about the public meeting.	*No response required; this comment was received via phone.*

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design	I support any option that improves fish passage and retains community uses of the dyke. My preferred option is 10A (I think), which is a smaller bridge with retention of parking. I also am interested in another design option that I suggested years ago. This would involve the use of a form of roll dam under the dyke instead of gates. This would prevent the Middle River from emptying (many people were concerned about the smell), would limit the entry of seawater to only higher tides, and would provide open fish passage at those higher tide stages when the roll dam is overtopped. This is obviously a very rough description but I assume the engineers can picture what I'm describing. Please respond if you would like further description. Finally, I would like to suggest a realignment of the various uses on the dyke following whatever improvements are made. I suggest the following order of uses from landward to seaward: railbed/DEST; shoulder; Route 1; shoulder; parking. This essentially swaps the placement of Route 1 and the parking area. The purpose of this is to consolidate the transportation corridors to the north and provide a more isolated parking/vending area directly on the Machias River shorefront.	Thank you for viewing the Machias virtual public meeting. I forwarded your proposed solutions to the engineering team.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design, Flood Protection	As a historian genuinely interested in the preservation of historic structures that have significant value to a community, I would normally be opposed to the removal instead of restoration of a 155-year old dyke. However, I also recognize that with each human-imposed structure, especially one as large and consequential as this dyke, we alter our environment in ways that negatively affect other community members and the ecosystems on which we depend. The construction of this dyke 155 years ago did just that. A select group of property owners whose land bordered the Middle River marshes petitioned the state legislature to build a dyke in order to improve the value and quantity of hay generated from the surrounding marsh allotments. They received permission to tax other salt marsh owners whose lands also bordered Middle River in order to fund the dyke's construction. Not all property owners along Middle River approved of the project or the imposition of new taxes. The construction of the dyke imposed unwanted changes on many other community members and users of the river. Fishermen lost access to migratory salmon, alewives and other diadromous fish; clammers lost access to the extensive tidal mud flats; and boatmen lost access to the river for transportation and the movement of goods. In short, the dyke was a taking of numerous public resources for the temporary benefit of a few. Indeed, while the quantity of harvested hay did increase briefly, its marketable value declined precipitously when expanding railroads brought better hays from the Midwest to eastern markets. Shortly after the dyke was constructed, Machias hay was no longer a marketable export item. The dyke, overtime, has generated a few other benefits: a briefly operated racetrack in place of one salt marsh area, the aesthetically pleasing pond created upstream of the dyke, and a well-used parking area for local sellers of fish, hand-made goods, and second-hand items. One upstream farm that still pastures cattle will lose some of its historically dyked lands to the higher tides. If the Middle River is returned to its original tidal flow, the former benefit would likely be submerged during high tides; the second would be available during high-tide periods. The third might as well be available to local community members if construction funds for a new bridge were sufficient. Opening the natural tidal flows of Middle River would resolve over time the significant siltation now accumulated upstream since damming. A bridge would reduce the threat of flooding of valuable structures and buildings in downtown Machias during sea level rise and storm surges as well as reduce the need for and cost of the wall proposed to protect Machias in the future. A bridge would permit fish access to upper reaches of the river and enhance local restoration of endangered-salmon habitat. Those increased	*No response requested.*
Environmental, Right of way	The baffles should be fixed and maintained. The negative impacts to residents and their property are unacceptable. In addition response times for emergency services are going to be increased to the detriment of lives and safety.	*No response requested.*

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Right of way, Flood Protection	Ruining/Flooding landowners property is ethically and morally wrong. The dyke should be improved and maintained in a way to be the least intrusive to peoples property. We are ruining bird, deer, and other wildlife habitat to better the flow of fish (i.e Atlantic Salmon that will NEVER come back in numbers enough to be worth spending even a single dollar on). Leave peoples property alone and use the least intrusive method of fix. Not to mention the major barrier this is going to create for emergency vehicles coming from the Eastern part of the county. This will significantly delay emergency responder which could result in loss of life when second mean everything.	*No response requested.*
Right of way	It seems the existing apparatus installed has sufficiently sustained the needs of the area since the time of it's inception. I fail to comprehend the necessity of interrupting the area transportation, to include emergency transportation to the local hospital which serves as the primary emergency care facility for towns to the east as far as 25 miles away. It seems there would be a much more cost feasible means to allow fish to swim upstream a few more feet.	Currently all options are under consideration. However, in September 2020, MaineDOT received comment from the National Marine Fisheries Service (NMFS). The agency administers the Endangered Species Act for Coastal Species as well as other laws that guide marine conservation and management. NMFS stated that the agency had substantial concerns about the in-kind replacement alternative stating that it would provide even less opportunity for fish passage than exists now and would likely have detrimental effects on physical and biological features of critical habitat for Endangered Atlantic salmon. The Endangered Species Act requires federal agencies to ensure that their actions do not jeopardize the continued existence of any listed species. Actions may not destroy or adversely modify any designated critical habitat. In response to these comments, MaineDOT and FHWA are re-considering alternatives that include options to improve fish passage.

Topic	Stakeholder Comment	MaineDOT Response
Environmental, Road/Design	Ideally, I would like to see Middle River restored while maintaining the character, as much as possible, of the dyke/bridge where people congregate to socialize and to sell local goods... along with, the Sunrise Trail. In other words, free the river and preserve the social/community spaces.	*No response requested.*
Environmental, Road/Design, Flood Protection	As land owners along the Middle River, we understand the need to allow the upstream migration of fish to increase their numbers, however we are concerned for our neighbors with lower elevation homes. We are also concerned about the cultural impact of removing parking on the dyke, which has become in integral part of our community. If parking must be removed, an alternate location should be found where the weekend marketplace can continue with the same exposure to seasonal customers.	*No response requested.*
None Provided	Phone message from a stakeholder: He could lose 50 acres. Does not believe bridge is needed. He has caught salmon and striped bass in the Middle River behind the Dyke.	*No response requested.*

STATE OF MAINE

DEPARTMENT OF TRANSPORTATION

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IN RE: MACHIAS DIKE BRIDGE, #2246

PRELIMINARY PUBLIC MEETING

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Held at: Machias Memorial High School
One Bulldog Lane
Machias, Maine

June 28, 2022
5:00 p.m.

PANEL MEMBERS:

Dale Doughty, Director of Planning

Martin Rooney, Planning Study Project Manager

Joyce Taylor, Chief Engineer

Kristen Chamberlain, Manager, NEPA

Heath Cowen, Property Office

(Hearing held at Machias Memorial High School, One Bulldog Lane, Machias, Maine, on June 28, 2022, beginning at 5:00 p.m.)

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MR. KITCHEN: Welcome. We don't usually see this many people here. This is really nice. I'm really glad to see this many folks turned out. Thank you for coming. It's obviously a very emotional issue and we have a lot of people who feel very passionate about this.

We certainly appreciate the opportunity to learn more and to have our voices heard and we appreciate DOT being here, and with that, I'm going to turn it over to the Project Manager, Marty Rooney.

MR. ROONEY: Thank you, Bill. As Bill mentioned, my name is Martin Rooney. I'm Maine DOT's Project Manager for the feasibility study for the Machias dike bridge. Before I get started, I'd ask the panel to introduce themselves. I just want to mention that this is part of the public process moving forward for this project. This will be out -- this is our third public meeting in the last year and a half or so. We do have a court reporter here to help

us document all comments and questions which will be part of the project record.

The agenda for tonight is a very, very brief, maybe 10-to-12-minute presentation which I'll leave and hand it over to Dale who will help facilitate the questions. We have quite a few DOT folks here who will help answer questions about this project. Most of the folks up front will do the talking and from my left to right I'll ask them to introduce themselves.

MR. DOUGHTY: My name is Dale Doughty. I'm the Director of Planning at DOT.

MS. TAYLOR: Joyce Taylor, Chief Engineer at MaineDOT.

MS. CHAMBERLAIN: Kristen Chamberlain, MaineDOT Environmental Office.

MR. COWEN: Heath Cowan, Director of the Property Office.

MR. ROONEY: Thank you, everyone. At prior project meetings we went through a lot of the details and a lot of the project history, some of the information regarding alternatives, some of the information timelines on the back, the back chart. We're really going to talk tonight primarily about what's happened in the

past two years, we're going to talk about some of the regulatory framework associated with this project, we're going to describe how we came -- how MaineDOT came to the decision of moving forward with our bridges of preferred alternative and we're going to talk about what are the next steps and what that means.

You all know the dike is -- well, better than most of us do. Today there's four box culverts, very old, very poor conditions. MaineDOT, typically we inspect bridges once every two years and if things get more acute, we inspect them annually. We're now inspecting the dike twice a year just to -- just to make sure it's safe and because of our own concerns.

Really kind of some of the milestones for this project that leads us here tonight is MaineDOT has been studying this for several years, well over a decade. What's really changed in the past 18 months is MaineDOT received correspondence from federal resource agencies that an in-kind replacement for what's there today is no longer viable. We've also received feedback and a legal determination that we have the ability to reimburse property owners who are

directly impacted by the -- by the project, and since we've kind of taken in-kind -- or the in-kind replacement was off the table, MaineDOT has gone back and looked at all together just under 20 alternatives to improve the causeway.

We've also heard from folks, and we'll talk about the project's purpose and need in a few minutes, that whatever we do, MaineDOT should look for ways to enhance the causeway features not just in Machias but Down East Maine and state-wide significance as well.

The regulatory framework of this project and a lot of these studies we do, as you may be aware, the majority of Maine DOT's capital funding comes from federal sources. With federal money comes federal constraints. Also, any project, regardless of how it's paid for, that is coastal or any project that requires a federal permit such as the dike bridge will need to follow federal process requirements. There's many rules and laws but to focus in on three, the National Environmental Policy Act will help govern our decision, the Endangered Species Act and Section 106 the Historic Preservation Act.

As Bill mentioned earlier, there's a lot

of sensitivity regarding the dike and different options considered for this project. We heard earlier today from a lot of people really imploring us not to make any changes. I've also heard from several people on the phone today asking us to build a big bridge to restore tidal flow. This project has a lot of -- there's a lot of passion and a lot of strong feelings for this project. When it comes to kind of the federal process, federal decisionmaking under NEPA, we -- we start out trying to look at problems, trying to look at needs and how to move forward as opposed to jumping to solutions and alternatives. Not everybody is going to agree on that it should be a bridge or it should be a causeway but most people will agree that Route 1 in Down East Maine is pretty important. It's important for the economy, a safe Route 1 is important, as well as the viability of the Sunrise Trail in Calais branch, so we kind of started up here in the public meetings that we've had already on this project, we focused a lot on purpose and need which I'll talk about for this project in a second. As part of the federal process, once we have this high-level purpose and need, we

consider different alternatives and look at kind of a data-driven approach to kind of somewhat qualitatively but predominantly quantitatively score and evaluate different alternatives. Then when we get to kind of where we think we are tonight with a preferred alternative, that allows us to move forward and by following the federal process and going through with the documentation, we try to minimize or avoid impacts but if there are impacts, we can mitigate them or in this case one of the things that we'll talk about is reimbursing property owners, the purpose and need that we've talked about for the last couple of years, high level from -- MaineDOT is a transportation organization, have a structure rating of good condition compared to poor today, essentially keep a safe Route 1 open as well as preserving the Calais Rail Branch Corridor. That's a core focus of the project. It is a transportation project, however, along the way we talked to a lot of folks, we talked to a lot of folks locally, we've heard from a lot of people and we expanded the purpose and need to include things such as maintaining existing uses at a minimum, the vending area, parking area. We want

to make sure that whatever MaineDOT does should consider whether it's a seawall or other adjacent planning. Any solution MaineDOT comes up with should minimize flooding and look at coastal impacts. We should also look for ways to improve fish passage and accommodate sea level rise.

And kind of starting out with this purpose and need, looking at almost 20 different alternatives, MaineDOT made the determination based on purpose and need, a bridge -- not a bridge the entire length of the causeway, I think it's listed 120 to 150 feet, kind of in the middle is what we feel best meets the project's purpose and need. It will allow for a continued safe Route 1, it will allow us to factor in sea level rise. As part of this bridge alternative, MaineDOT can continue to work with the town, regional stakeholders by not just maintaining uses that exist today but really expanding additional uses. The causeway -- a bridge will also help the recovery of endangered species and a bridge will be eligible for federal transportation funding and as we continue down the process, MaineDOT will compensate directly-impacted property owners.

So where do we go from here? We had a meeting earlier today that many of you were at kind of focused with property owner concerns. MaineDOT is not starting construction on the project in 2022. MaineDOT is not starting construction on the project in 2023. This project -- various planning efforts have been going on on the dike for over ten years. We're now formalizing this with a preferred alternative which we're going to carry forward and document all the information we've heard to date, both from the public, both from stakeholders as well as scientific information we've gathered, as well as continuing to gather additional information. We heard a lot earlier today and in the past couple days related to concerns with the clam flats, related to concerns with the former town landfill. All this information will be gathered and be taken forward into an EA and before we conclude the environmental assessment process, we will be back here for another formal public meeting.

We're also going to continue the conversation with directly-impacted landowners. You'll see my e-mail at the end of this

presentation. There are on the back table in envelopes comment cards which you can reach me on. We'll continue to gather input but we do realize landowners impacted will have some unique concerns and will be involved in this process for the next -- the next couple years through continued planning and design. There are a bunch of these pamphlets, MaineDOT Projects and Your Property. On the back they describe the process in detail. So as we move forward after tonight, not just gather your input, we're still going to reach out and have conversations of what the process will entail for those directly affected, and then there's -- planning is not over tonight. We've identified that MaineDOT is taking a preferred alternative forward. We've also made the commitment to continue to work with the Town of Machias, yourselves and others about what can we do together to make the causeway area a special place. Obviously we -- we've been here on Saturdays during peak vending times, we've noticed some safety concerns, that's something we want to look at. We've heard ideas from greenspace, overlooks, continued ATV and snowmobile use, we've heard ideas about a

sidewalk on the other side of the dike. Those are the sort of features that later this summer and into this fall we want to work with you on.

Just moving on to next steps, I'm going to pass it over to Dale who will introduce you to the planning process.

MR. DOUGHTY: As Marty said, a lot of tonight is to hear from you. I think we'd like to hear from -- there's a lot of people here tonight so I'm hoping we hear from everyone. A couple things, I know it says, number one, raise your hand but I think if you could, kind of work your way to the mike, a few people, and cycle through. If for some reason you don't feel like you can work your way to the mike, please raise your hand and Mike in the back, another Mike, a different Mike, we'll see if we can get the mike to you if for some reason you don't feel that you should work your way to the mike. If you could state your name, your municipality and if you're representing an organization, especially something affiliated with, if you would let us know, that will help us contact you and put your comments in context. There are a lot of people here. What we hope is you'd limit your comments

to about three minutes and let the next person speak. One of the reasons we'd like to do that is, one, to get everybody through. We'd also like to have some time in the end for us to come out and talk to you individually. So if you have more than three minutes' worth of comments, if you could kind of keep those concise, we're more than happy to stick around and come chat with you after.

As Marty said earlier, MaineDOT will be accepting comments going forward. Here's Marty's information. He's got a comment card in the back of the room and you can get ahold of any of us if you can't remember Marty's contact information and we'll filter it to Marty. So I guess I'll open it up to the public. If things go on for a little while, I may stand up. That just means you've kind of gone well beyond your three minutes. Yes, sir.

MR. SPRAGUE: My name is Lloyd Sprague. I live in Marshfield. I'd like to have you go back to one of the pictures that you were showing on there. It's high tide on one side but it's low tide on the other.

UNIDENTIFIED SPEAKER: I think you passed

it.

MR. SPRAGUE: No, he didn't pass it. Go back. Right there. Go the other way. Right there. On the right side is high tide, on the left side it's low tide. If it was high tide on the other side, it would be going up all the way up around Dunkin' Donuts. Dunkin' Donuts will not last very long because there's that filled land and I helped fill that. I used to own that. We got permission to fill that. When the tide starts washing that, that will all go. So that's a misrepresentation of what's going on.

I would also like to have each of you say your name and go on record as saying which is more important, fish or humans. Would you please do that for me?

MS. TAYLOR: No, we're not going to do that.

MR. SPRAGUE: Okay. So you don't --

MS. TAYLOR: We're here to have a conversation. We are trying to protect Route 1. We are caught in a fish situation. Our mission isn't to pass the fish. We have been told we cannot keep it as it is. I am worried about your bridge, I'm worried about keeping Route 1 open.

At a certain point we have to take some action and that's what this is about.

MR. SPRAGUE: Okay.

MS. TAYLOR: I think -- I am happy to sponsor a meeting with NOAA to come up here and do this. Whether they'll come, I don't know but we'll invite them to have this conversation and you can ask them that.

MR. SPRAGUE: Also, we were told that the landowners that would be hurt by this would be reimbursed. Does that mean that right now we could have our property assessed what it's worth and then after it's ruined they'll get the difference from the State?

MS. TAYLOR: I'm going to answer broadly and then let Heath answer. This is going to be a frustrating process for property owners for the next year because of the NEPA process, we cannot talk to you about numbers and money. We're not allowed to. So I know it's frustrating, it stinks but we -- one of the reasons why we chose a preferred alternative instead of both the culvert and a bridge right now is this process is mandated to be done in a year. If we had kept multiple alternatives, it would have gone on

longer so we're hoping to be able to get to an answer sooner by doing this. Heath?

MR. SPRAGUE: Can I just say one more thing and then I won't bother you?

MS. TAYLOR: No, you're good.

MR. SPRAGUE: Everyone that's sitting here that wants the dike fixed, would you raise your hand? Everyone that wants the dike fixed, raise your hand? See, we want the clappers fixed. And also I just want to say this: when he said he got many phone calls from people that voted the bridge, evidently they don't live here if they have to be by phone. Please do not disturb what we have in Machias.

(Applause)

MS. TAYLOR: I can tell you I completely understand these comments. We stalled on this project for over ten years. We have not gone forward with any flooding option for over ten years trying to get NOAA, frankly, to let us do in-kind solution. They have finally come out and said they will not allow it. That's where MaineDOT is. They will not allow it. We have tried -- tried to do that. I will say one of the reasons why we went to the bridge option rather

than the culvert option is the culvert option would flood less. It floods like 125 acres, 50 acres, and all this is still approximate, okay? We need to just -- partly why we need to move forward is to get more information. The bridge option floods about 400 acres. If you're in that Zone between 150 and 400 acres, you're like in land purgatory because what NOAA has said to us if we did the culvert, they're going to make us sample for fish every year and reevaluate whether they're going to continue to want more flooding and more passage. In the last letter they wrote to us, we know we can't meet the fish passage standard they set with the culverts and so we asked them, so what are you going to do to us if we do the culverts, and basically we might just keep making you take the gates off the boxes which means we're still going to flood 400 acres and we don't have a process to really work with people who are in this in-between place, and so we felt, you know, that going to the bridge option at least gave people some closure rather than have them not know for 10 or 15 years whether their land is going to be flooded, but this is a preferred alternative, right? If we

find out information about the landfill, if we find out information about the clam flats, the alternative could flip. We could tell NOAA we -- you know, I don't think we can ever go back to just fixing the dike, okay, but I think the only other option was the culvert option and that is what we've been left to deal with.

MR. COWAN: This is Heath again. (Phone ringing) Just from a property value standpoint, generally speaking, how it would work is we will have an appraiser that comes out. Again, this is at some point in time in the future when we have that preferred alternative which if it becomes a chosen alternative, we will figure out what the impacts are going to be, what the actual elevation of the flooding would be and then we'll look to see what your property values are before the project and what they will be after the project due to those impacts and you'd be eligible to be compensated for the difference between the two. So basically you'd have a fair market value before and you'd have a fair market value afterwards and then the difference between the two would be your compensation, again, generally speaking.

MS. TAYLOR: And there is a Land Claims Board so if you disagree, which people often do, there's another process you can go through without a lawyer. It's set up so landowners can go and represent themselves. So just because we give you a price doesn't mean that's the end of it and you have to go hire a lawyer.

MR. COWAN: And just to go a little bit further with that, that's called the State Claims Commission and it's a board made up of three people. It would be a county commissioner, it would be an appraiser, as well as a lawyer. DOT would explain to that board how they came up with those values, you'd explain to them how you think the values are incorrect and then you could get an additional award from that board. You'd never get less out of that board. If you still didn't agree with the State Claims Commission, you'd have the opportunity to go to the superior court here in the State of Maine. At that point in time you probably would incur some real costs because you'd probably want to have a lawyer, but as Joyce said, you don't need a lawyer to go into the State Claims Commission. You certainly can have one if you'd like but you don't need to.

MS. TAYLOR: Other questions?

MR. DOUGHTY: Do we have somebody else?

MR. ALBEE: Hello, my name is Geary Albee, I'm from Marshfield. I am a landowner down there along the river. I've got three minor things I'd like to touch on just a little bit. First I'll start with history. You may not like history down there but I'm going to mention it anyway. On my deeds that I have it mentions long beds. Anyone here know what a long bed is? Well, years ago there was a community effort, when Machias first settled a lot of farmers, landowners, village members, they all took the cattle down there in a community effort and grazed them altogether, and then it was divided up into small sections and they had a problem with flooding. So long beds were dug by hand, impossible to get machinery down there. The long beds were dug by hand, nobody used spikes, it was ditched, probably took over a thousand feet from Joy's land down to the edge of the river. There's probably, counting, 15 or 20 of them. The long beds, the longest ones are probably close to quarter mile. They dug those by hand, the community did. You don't care. You're going

to -- it's not enough if -- you've made that decision already but look at the history that was here back in 1800s that made it -- that's probably wrong -- late 1800s, early 1900s. That was hand work. I'll get over that.

Number two, the chemical EFSAs, I was hit with that. I was told I could not hay anymore at Machias Valley Airport because there was some human sludge that was dumped out there over the years. Now, we've got some false information going on here, folks. This EFSA was a chemical used as a fire retardant we've been told all these years. It's in the seats you're sitting on to slow the burn rate down, the chairs you have in your house to slow the burn rate down, the mattresses on your bed. That's where the chemical was used. My question is, how did it get in human sludge? It comes through our bodies to get in that sludge. Where is it, folks? No one is telling us. Is it acid rain? Uncontrollable. How many sites up and down the dike have you tested for EFSAs right now? The dump sites, there's two of them there. Somewhere along the line you're going to find EFSAs are going to start up again when this chemical is

started to be used. Maybe not the first site down there by the railroad tracks. It may not be there because very, very early history, I don't know what was dumped there, a little bit of leather, maybe wagon wheels, whatever, but if you get into the newer dump up there where they've got the test sites now up by the collection center, you might find some EFSAs there. Down on the dike where my cattle are there are three streams running through there. I didn't mention it but I do have cattle down there.

Probably there's 60, 75 acres down there that I own and that's where I run my cows. They're strictly beef.

But the next question is, you mentioned it just a little, the money being used in this project was federal money coming up. Okay, years ago what money built that dike? Was it local money? Was it local volunteer money? Because we wanted a passage to go to East Machias and there weren't very many vehicles then. We were probably processing parts. Did we build that bridge ourselves? Was there any State money used? Do you have that history there, who paid for all that originally? I know they were all

local builders, very few dump trucks in the area. That's why it probably was built with gravel and not large stones like it probably should be right now, like a jetty built out into the ocean. It would last a long time if it was large stones. My question is, maybe the locals ought to come up with building this again. Thank you.

MS. TAYLOR: So Kristen didn't write down your first piece that you shared about the history because I wasn't familiar with that. I don't know if you were. So that's good information. That's the kind of information we do need because this is preferred alternatives, not chosen alternatives.

MR. ALBEE: It sounds it.

MS. TAYLOR: I understand, that's why we're here, to try to explain it. We are currently working on doing some test pits with the old dump. I completely understand what you're saying. I can tell you that I don't see us moving forward with a bridge if we are going to cause contamination. I think that's a show stopper and that's where we go back to NOAA and say, hey, we just learned some more information. So right now part of what we're doing is we're

getting more information on the dump, we've engaged DEP and said you guys need to have to get involved here because we need to understand, you know, can we fix it, is it unfixable, what's the deal because both the culvert option and the bridge actually raise the watertable so there's a problem either way, so we need to figure that out. We will share reports with people when that comes and we're also going to chase through kind of I noticed some issues that came up earlier today about siltation and what happens. The preliminary testing that we've done of the area that might be dredged looks really promising but we haven't -- we haven't gone as far as we need to go. We need more information, okay, and we're going to get more information.

MR. DOUGHTY: Would someone else like to speak?

UNIDENTIFIED SPEAKER: Does the sound system go up any higher?

MS. TAYLOR: Oh, can you not hear us? I don't want to sound like I'm yelling at you.

MR. ROONEY: It sounds like it's really loud up here, so we're talking soft but we won't do that anymore.

MR. ROBBINS: My name is Joe Robbins. I have a business in East Machias, most of the people over here are my friends. I'm a fisherman too. We moved to Machias from Eastport in 1960. I made my first trip up the Middle River to catch trout, I got several, took 'em home, my stepfather scolded me because half of them were salmon and that's all I want to say about the fish.

I think if we do go back to gates, leaving some open for fish passage may be a good alternative and they could be monitored.

MS. TAYLOR: Thank you.

MR. ROBBINS: That's all I have to say.

MS. TAYLOR: Thanks.

MR. DOUGHTY: Feel free to come right up.

MS. TAYLOR: Don't be shy, that's why we're here. And honestly, part of the preferred alternative, if you tell us stuff we don't know, that goes into the record. That's part of this process, so we do need to hear it.

MR. WHITE: Howdy. My name is David Whitney. I'm from Marshfield. I moved to Marshfield from Machias. It was a long trek. A lot of friends in this room and I think everybody

in this room is conservation minded. I don't see anybody here that doesn't care about fish and wildlife and there's -- there's a balance about the wildlife. It sounds like -- I was at the meeting today so I may be a little bit repetitive for you but there's new people here, but NOAA is steering the ship in a big, big way and I think that NOAA really needs to be at the table and understand what we're dealing with. I'm not qualified to give an analysis about what -- what the two dumps could do to the sediment and the leachate and how it moves downstream to potentially Machiasport and Cutler and those clam beds but if -- I'll just say if that happens, the economic impact to this area, clamming is very large in terms of the economic engine and of course, the clammers themselves in recent years have had kind of a boom, the price has been high, the quantity has been good. The Town of Machias has shut off clamming for the folks in East Machias for a number of years and parts of Machiasport because of our sewer system, and that's -- that's a sore subject, but this is something that we're going into hopefully eyes wide open, and so if we hurt those clam beds and

it shuts off that economic engine, it doesn't just hurt the clammers. It hurts Pineo's True Value which sells boots and gloves and baskets and Johnson's Town Line that sells tires and fixes the rusted-out vehicles and inspects them, and Whitney's Tri-Town Marine that sells a few trailers and boats and motors and Hannaford and on and on and on and rents and mortgages and livelihoods. We have a depleting number of people that live here. The population in Maine is getting older. The population in Washington County is getting older still. I've got a son who is unbelievably bright, I mean, I don't know how he gets the grades. It didn't come from me, but he's clamming this summer because it's so lucrative or hopefully lucrative. He really hasn't gotten into it. This is an attraction for young kids. This clamming industry is something that keeps them here. They might have a job at the post office, they might have a job, you know, in a government agency, they might have a job with the town, the university and they also clam but there are a lot of people that make clamming their livelihood and that is so, so enormous. I mean, I could come up with all kinds of excuses

why this shouldn't happen, not the least of which Trail 101 which is two trail clubs, the Down East Trail Riders and the Ridge Riders' Trail Club, two clubs that have developed that trail through the generosity of two of the landowners that are going to be impacted and then landowners beyond. There is no way around that trail. Back in the sixties and seventies when there was no trail system and people accessed woods roads, they were just finding ways and the only way to get from Machias through Marshfield to get beyond to Northfield and Wesley and whatnot was to go across the Machias Middle River and that relied on ice, and I remember as a kid watching when Wayde Carter decided it was safe to cross the river, then it was safe to cross the river and then as the clapper gates stopped working as efficiently and the saltwater came, it became even less reliable. So that trail system is paramount for the snowmobiling industry and it is also an industry here in Washington County as you well know. DOT is a part of it, and it's important. These are all important things. I appreciate you guys. I can see what a balancing act you have, you have a challenge in front of

you and you want to hear all sides. Thank you very much for listening.

(Applause)

MR. DOUGHTY: Thank you. Would someone else like to speak?

MR. KIDDER: How you doin'? My name is Eric Kidder and I'd just like to say I sold on that dike for 17 years. I've seen striped bass come out of that water on the opposite side of that dike 42, 48 inches, I don't understand about the salmon, whatever. You know, they say salmon can't survive at present but the bass survived, they come out there and I'm not a hundred percent sure but I believe and I think my wife's great, great grandfather put a wooden pier in there originally and made that dike what it is today through a wooden pier. Now, I know it doesn't mean a lot to some. When I started there 17 years ago, we had three people down at that dike. If they destroy the dike now, we're going to be right back to square one again where I'm the only one down there again and have to be built back up, people who bring business to this town. When people come in here, they have to buy gas, go out to eat, whatever. As much as a lot of people say

that we don't do nothing for the Town of Machias, well, we do by selling our wares and also do it by giving business, buying gas and stuff that we need, and I'm also concerned about the sewerage treatment plant running in there. What about that? You know, about all that gunk and stuff coming straight in there stinking to high heaven. They say it's treated. Well, is it really treated? You know, I don't think it is. I've seen that go in people's food up there at Helen's Restaurant. I've been down there in the wintertime when the Dike's (indiscernible), I've been down there when it's flooded, you know, I've been down there every imaginable way. I kept people back so we didn't have accidents down there, you know, I fought for 17 years to be able to (indiscernible). Right now we got a full dike but that's going to be all gone. That will be all completely gone and for how many years? Probably three if we put a bridge in there, you know, and chances are there's probably not going to be a comeback. That's about all I have to say. Thank you.

MS. TAYLOR: Thank you.

MR. DOUGHTY: Anybody else who would like

to speak?

MS. BARKER: My name is Julie Barker from Helen's in Machias. Before Helen's, my husband and I owned the knit shop and farm in Machias and we now live in East Machias where we can look and look down on Schoppe Marsh. I didn't know they were called long beds. I can see lots of those from my house every morning and had seen them from the farm for years. When the trail clappers were removed from our property, no one ever mentioned that it was happening. They put in a trail, that was great, they removed the clappers and we didn't have any land to put -- Dave Craven had brought his sheep to pasture at the farm. The next year he couldn't do that because the land was covered with water. It doesn't flow out very fast, it's a muddy mess, so we can definitely see what's happening with that.

As far as Helen's goes, we kind of have our fleet all over the place, our son is a clammer from Machiasport involved in the conservation of clams in Machiasport. So knowing that it's contaminated, a lot of the time when there's overflow when the rain is bad, it impacts them. Clams are one of our biggest sellers at

the restaurant. We buy only local clams, so this is a very important piece.

I wish somebody from NOAA would be here. My grandkids live above Middle River Bridge. They catch sea trout at their house in the river and they are above. So the fish get in, the fish are getting in. The stripers are there. You know, as far as the controlling of the fish, it's very difficult to say, you know, they're going to be monitored to see where the salmon are coming from and it's difficult for us -- those of us who live here who see the fish are there. Maybe not all of them but green crabs are there and sea crabs are there. So it's -- it is an emotional piece but we all -- like John said, no one here is not an environmentalist. That's how we survive. We are Down Easters, we work hard, we try to support one another, we buy as much local as we can at the restaurant and we will continue to do so and, you know, clams might not be as important to NOAA as the salmon, I'm not sure where that goes but maybe whales are more important than lobsters to NOAA. So, you know, it's a tough pill to swallow when we think uneducatedly that fixing those clappers would be

cheaper for the State, it would be more time -- it would save time. As the project goes, it's difficult to see. David and I have not done a very good job of protecting the point from erosion because we've had a fire, we've dealt with the pandemic, we're just kind of mowing the lawn and leaving it out there but it is eroding some and living at the farm since 2004, very rarely have we ever seen water splash over the trail or the dike, occasionally debris and at the restaurant, I've worked at the restaurant since l981, the water has never come any higher than it ever has around the restaurant. It comes to a certain point and then within a half an hour it's gone back out. Is it deal? No. Has it always happened? Yes. And I do think that the water is rising. I do see where that's splashing out, and where the little lighthouse used to be, we took that down because of that reason.

So thank you for being honest with us and please get NOAA to come to Machias to listen to what people would have to say.

MS. TAYLOR: I will do my best and I will guarantee that we will be sending them the transcript of this meeting. So I did want to

just say something. It's not as easy as fixing the clappers. The beams in the boxes are rotting. This is a whole project. I mean, it's not just putting clappers on. I haven't said much about it but when Marty mentioned that we inspect it every six months, you know, as chief engineer, I have a responsibility to post and close roads. I've done that. I've got a lot of people who haven't liked me over the years but I do what I have to do to keep people safe. I don't want to have to do that here. I don't want us to get to that situation, and so we're trying to get to an alternative that could be built because we don't want to be in that position. We haven't talked much about that but I just wanted to share that that is something that we're concerned about. If that concrete slab that's over those boxes goes right now, we don't know how to fix it, and so that's really troubling to me and so we're trying to keep an eye on the condition of the box. The first thing we need to do is post the bridge and get the heavy trucks off, but we don't want to be in a position where this goes on, you know, for six or seven more years and we end up closing the bridge. So I

just wanted to share that.

MR. CARTER: Hi, my name is Wayde Carter and I'm a selectman here for the Town of Marshfield. I was born in Machias, grew up in Marshfield, I fished Middle River, my father was a game warden, I spent a career as a game warden and I have seen Atlantic salmon, stripers, sea trout, smelts, glass eels, all of them. I spent a lifetime on the river. I still spend time on the river with my kids.

Has there been any studies as to what's there and what's not there as far as fish? Have you done any studies?

MS. CHAMBERLAIN: We haven't done any formal studies. We've been relying on State and federal agencies to offer what's there and also the regulatory framework for endangered species -- the protection for some of the species is there regardless if the species are there.

MS. TAYLOR: I would just say DMR, IF&W, U.S. Fish & Wildlife, NOAA have all been giving us their information because we take it from them. I think what is concerning is that NOAA offered with the culvert, the fish passage number that they wanted us to meet is impossible to meet

and so that's part of the conversation that we continue to have with them. I think -- you know, I don't know what they have for information but this is good. I think we need to press back and, you know, there's a lot of anecdotal stuff with people who have obviously seen fish.

MR. CARTER: I was a game warden for over 20 years and I enforced the laws there. In the 1990s, NOAA pushed us into putting more restrictive trout fishing regulations in because of the salmon. We spent 26 million a year for years and years and years to bring back the salmon. They're not coming back. We could spend 26 million a year to bring the dinosaurs back too but they're not coming back. Things go extinct. People don't. So what's more important, the Atlantic salmon or people?

MS. TAYLOR: That's a good question for NOAA.

MR. CARTER: I want to know what the studies are because you can open up that passageway and there could never be another Atlantic salmon or another fish come through that bridge and it's too late after we do it. We've ruined people's land, we've ruined fishing and

the other thing I want to mention is Machias -- nothing against Machias, Machias is mentioned as the one that's losing stuff. Marshfield is losing more than Machias is. We have 55 people that are going to be directly affected by this bridge going in and I would just like some answers. What are the studies? What fish are there? What fish were there? What's the history? Because moving forward without that, you've got to admit it's a little bit putting the cart before the horse.

MS. TAYLOR: So conversation, it really is about the Atlantic salmon at the end of the day.

MR. CARTER: I know.

MS. TAYLOR: That's really what it comes down to.

MR. CARTER: I know. I spent 25 years doing it but they're not coming back. How much -- there was one quote in the paper back awhile ago that if they had the money that was spent to go to Mars, they could bring the Atlantic salmon back. Do you want to spend that kind of money on the Atlantic salmon? I mean, let's put something else in there that is going to thrive. I mean,

dinosaurs went extinct. We're not trying to bring them back.

MS. TAYLOR: I think this is a good conversation for NOAA. You have no idea how much we share your frustration because we over build a lot of bridges because of Atlantic salmon. Our work on those is crazy to the point that contractors have about six weeks to be in the water all summer long and you can imagine how much we pay for that.

MR. CARTER: I understand but how long are we going to put up with NOAA? I mean, they're not here. Does anybody see NOAA here? They won't be here next week, they won't be here when the economic thing crashes because of the clamming. They won't be here. They could care less what happens to Washington County, but let's bring the salmon back. I think we need to stand up to NOAA and have both. Why can't we have both? That's what I have to say.

(Applause)

MS. TAYLOR: I would say we have stood up to NOAA since 2009 and we have not been successful and now the condition of the bridge is such that that's what's pushing us to do

something.

MR. SHAW: Good afternoon. My name is Dwayne Shaw. I'm the executive director of the Down East Salmon Federation and yes, I think we can have both and there are places where many Maine communities benefit from having both. Some of these things seem completely infeasible. I've worked for ten years as a shellfish biologist out of Beal's Island. I've worked up and down the coast of Maine doing shellfish restoration with planners and communities and a good friend of mine in Harrington called me a couple of -- about two years ago and he said, Dwayne, what are these holes out here on the clam flats, I don't know if it's a seagull or -- there's something going out here and by the way, we're seeing really strange fish. You talk about dinosaurs and prehistoric fish, there's something called a sturgeon, right? Most people in Machias maybe have never seen one in the local waters and neither had Bobby Beal over in Harrington. And we teased it apart and figured out these are sturgeon and they're coming on the clam flats and they're taking little Dixie cup loads of mud out and they're looking for clams and perhaps crab and other things to eat.

So why all of a sudden are there sturgeon in Pleasant Bay where there's another set of tide gates by the way, and the only answer that seems to be likely is that at the Edwards Dam over on the Kennebec, on any given day you can walk down to the center of Augusta and watch these dinosaurs jumping out of the water one after another. People pull up there and watch them. It's absolutely amazing. The Penobscot, same thing. Major, you know, distress, what are we going to do about these old decrepit structures, there's a lot of old decrepit infrastructure that we're wrestling with and they now have shad fishing, shad derbies going on on that river where there have been only very, very few shad ever documented for centuries. So they can come back, dinosaurs even -- the sturgeon are older than the dinosaurs in fact. So the point is it's incumbent upon us to try and to continue to try, to continue to try to work together and in the case of Down East Salmon Federation, I said I'm a resident of the Town of Franklin and I sit right at Pond Bay and Donnell Pond and I watch -- the fishing moves back and forth in that location and we -- the Salmon Federation, which was created by

local anglers and conservationists, many of them are in the room, Gary is one of them, Dave is another, it's all any number of folks, Julie has been a supporter of what we've been doing over time at Helen's and we're in it together. This stuff is falling apart. It needs to be dealt with. We can try to throw NOAA under the bus, we can say, you know, the Endangered Species Act should never have been passed, you can blame Richard Nixon for signing the bloody act, but in the end, we do care about fish and it is possible to bring these things back and have our cake, our clams and eat them, but it's not going to be easy and DOT, in our opinion, the Down East Salmon Federation, Joe Robbins spoke earlier, we have about 1,000 members in the region and probably 4,000 people of various walks of life that support us.

We have two salmon hatcheries, one in East Machias and one in Columbia Falls and we're stocking three rivers, the Narraguagus, the Pleasant and the East Machias, and we're on the cutting edge of new science around how do you run a hatchery that actually works. So the federal people, they can make mistakes over and over and

over again and stay in that rut or they can innovate and, you know, the nongovernmental groups like the Atlantic Salmon Federation are in the job of innovation between all of this mess that we're in, whether it's sea bass or you name it, stocking salmon that never return. It's not beyond reasonable doubt that we can figure some of this out and that what we've done can actually lead as we have in so many ways over so many years.

The long beds, the history of these places most of our families were involved in this in one way or another, loggers, along with fisherman, you name it, on and on, and today there's a new economy and I am part of it, the 12 employees that we have working in Washington County right now, plus numerous interns, tons of students, lots and lots of volunteers have put their time, hearts and souls into this and -- because we're making progress and that's the restoration economy. When we look at a 200-year-old dam in Whiting and it's for sale, the Down East Salmon Federation stepped in and bought it. When there was a house that burned on the dike in Addison right on the structure, the landowners

came to us and said you convinced us, we think we'd like this to go to you, as did the one buyer down in Baird who has property up there, marshland, he came to us and said, yeah, it makes sense, you should recover these ecosystems that feed us and that we can be proud of.

So we're -- we're here to stay, we want to work together, we're not going to throw NOAA under the bus. U.S. Fish, DMR, IF&W, DOT, you're all moving too slow as far as we're concerned. This stuff needs to be dealt with and the DEP is another in terms of the sea bass situation. So if there's a way to fix some of this, we're -- we want to be right there with you all and that includes people who use the dike and sell antiques or whatever they do or putting some cattle out on the marshes, if there's a way to do it, we want to try to work together but we are in support of this alternative at this point in time and that is contingent upon any future information that might come that says the clam flats are going to get contaminated or someone's well is going to get destroyed or anything like that. Thank you.

MS. TAYLOR: Thank you.

(Applause)

UNIDENTIFIED SPEAKER: Can I ask one more question?

MS. TAYLOR: Sure.

UNIDENTIFIED SPEAKER: Whatever happened to the salmon where it used to be up in Narraguagus? Where did that go, the Atlantic salmon? It's no more. Now there's another one down here. I don't get it. What happened to the one up there? Why don't we start that one back up? That used to be a nice thing up there years ago when I was a kid. It's not there no more.

MR. DOUGHTY: Anybody else who would like to speak? We can also spend some time with you individually. Yes, please come on up.

MR. ROBBINS: Hello, my name is Charles Robbins. I'm from away over to Pleasant River. I have friends in Marshfield and I have friends in the Salmon Federation so I don't really have an opinion on this project, but I did work for the MDOT for a few years, I'm retired, and I worked on a few bridge projects. Are any of you familiar with any bridge with similar hydraulics and water levels and all this compared to this one here? Do any of you know of a bridge that

would compare to this? Anybody?

MS. TAYLOR: I'm not entirely sure what you're asking.

MR. ROBBINS: Well, there's got to be certain hydraulics, the water moving in a certain direction.

MS. TAYLOR: We have been looking at that and we need more specific information prior to choosing an alternative. This would be surveys to get more information on the ground.

MR. ROBBINS: A good example I think would be Bagaduce in Penobscot. We worked on that bridge. It's a narrow bridge. It's almost like a Venturi to your carburetor. The water is channeled into a narrow bridge. It is extreme currents. We tried to take elevations. We had a dive team there and while they were playing with the seals, the water level was equal and in just a few minutes, like 15 minutes, it fluctuates because the water is restricted in that area but when that water moves, you're going to move some vegetation, silt, gravel, everything in that area and I think this new way, you're going to be moving siltation for a long time. Do you have any plans to handle the siltation?

MS. TAYLOR: That's definitely something we need to study more. We don't have solid answers right now but part of looking at this is to answer those questions.

MR. ROBBINS: Yeah, but other problems, plant erosion, you have flooding in certain areas. It's going to change the whole environmental impact in that whole area. I don't want to tick off my friends in Marshfield. They've always been my friends and I'm worried about their concerns too. Thank you.

MS. TAYLOR: Thank you.

(Applause)

MR. DOUGHTY: Anyone else that would like to speak?

MR. SPRAGUE: My name is Chris Sprague, I live in Marshfield and Machias. It's hard for me to set here. I feel like I'm at my own funeral. I've lived in Marshfield for most of my life. I have land -- most of the pictures you have is the majority of the land I have. Now I stand to lose about 90 percent of my property. To me, I know you talked about you've been studying this for ten years and you've got to do more studying. Holy cow. Could we have fixed the clappers when

we first noticed the problem and we wouldn't have to run into all this foolishness? You take salmon, salmon were in Marshfield. Mr. Robbins spoke about catching them when he was younger. When he was younger, the clapper system worked completely. It shut off the tide once the tide equaled up so fish get through. There's been some new video on striped -- striped bass up in there I think even the last few days. These fish get through there. It sounds like NOAA wants to pound how many fish up through there? To me, they're just telling the fish where to go instead of where they want to go. It will never be back to what it was if you open it up unless it has to be opened up completely but to me, it will never turn back into what it was. We hay down there, we have cattle, slowly the dike system has been decayed and we haven't been able to get on there to hay. The river banks that are down there, they're just brown now. I live on a peninsula, my land will be a swamp and I could stand here and cry but it affects a lot of people. (Crying) I just wish you would listen to us. I feel like we talk on deaf ears. There are other animals in there, there's a habitat that's there now with

very unique animals that will be flooded out and see if we can get some magic fish up there that we don't have. A sturgeon, wow, a sturgeon. How about a manatee? Let's hope maybe a manatee will come up in there. Anyway, I don't really know what to say. Thank you.

(Applause)

MS. TAYLOR: And Mr. Sprague, you asked if someone would come walk your property, and Kristen and I are going to come do that with you.

MR. SPRAGUE: Thank you.

MR. DOUGHTY: Please.

MR. ALBEE: Geary Albee again. You mentioned earlier about a trail system and you want to walk the property. It is beautiful down there where I've got my cattle and they are friendly, they won't chase you really, but it is an opportunity to start at the riverbank down there where the vendors are right now and it would be a beautiful walk up along the river. As you get to the edge, this is another manmade part up there. They dug mounds out next to the river, oh, they must be ten feet high along the riverbanks there, and where the streams run into the river, they couldn't right there but it would

be an excellent chance to put some small foot bridges there. If you want to walk up along that river, you're going to see a lot of different birds, there's geese in there right now, there's cormorants in there right now, the geese have already laid their eggs and the little ones are running around, there are minnows in them streams, there's turtles in there. I watched some turtles probably just three weeks ago digging there in the mud. It would be a beautiful nature walk up along that river on the west side. The east side, the bushes are probably five or six foot tall but up there where the meadow grass is, it is nice walking, especially on the high bank along the river. You can see a lot, beautiful along the water and it's an opportunity -- I'd love to walk with you ladies down there, anyone that wants to take a walk along the river, glad to give you a tour. Thank you.

MS. TAYLOR: Thank you.

MR. WHITNEY: Thank you for allowing me to double dip. My name is David Whitney, I'm from Marshfield. I remember back in 1989, 1988, '89, '90 time period there was a gentleman by the

name of Tom Sawyer from Bangor, he's a friend of mine now, at the time he wasn't, he proposed to develop an ash landfill in Township 30, and that -- there was a huge -- I bet maybe 25 percent of the people in this room worked against Township 30 and I think the slogan was "keep your ash out of Washington County," and I remember listening to Tom Sawyer talk about -- and his attorneys talk about how to mitigate any leachate out of this landfill, that they had a certain membrane three-quarters of an inch thick and there was no way, no way anything was going to get through, but we were hell bent on protecting the Mopang Stream because it's a natural -- to use my friend Charlie's name -- Charlie's phrase, it's a natural hatchery, just a beautiful fish way and it's worth protecting. So now I look at what we're doing with our eyes wide open. We've got two dumps that we're going to hit and we're going to have to study it. You know, you've explained very clearly that it's going to be studied but I just need to share, that dump when I was a kid, there were no rules. The rule was you back up and you dump it, whatever, whatever it was and who knows what it was, and it was burned and

there was no lining, there was no magic lining and I still agree there's probably still not a magic lining that's going to stop anything from leachating. You know, I remember my Ziploc bag in the back of my truck with a little bit of halibut in the back. That didn't keep the stink out, but the point of the matter is there is no lining on the Machias dump and so now this is -- this is another type of development. It's a development. Putting in a bridge to some entities, some people, is a development opportunity. It's to develop the way it should be or something, but in the process, we're going to mitigate that problem. Well, that's what Tom Sawyer said but man, we weren't going to listen to that. Tom Sawyer couldn't mitigate it, not and protect the Mopang Stream but here we have a dump with no lining and we're somehow going to potentially mitigate? Sounds like a Super Fund cleanup site to me. I think we ought to leave well enough alone and keep that tide at bay, keep that tide at bay, keep that tide at bay.

(Applause)

MR. CRAIG: My name is Dave Craig, I'm from Bucks Harbor. One thing I ain't heard

talked about so far, and I apologize for looking like a dirt bag but I just came right straight out of a hay field to get here, and that's what I want to talk to you about. One thing I haven't heard talked about is the habitat that's up in there now that stands to be lost, and I will say I'm glad you presented yourselves the way you have because I came here ready to eviscerate, you know, someone from DOT and you've been professional and I will throw NOAA under the bus because they seem to be the villain in this if they're unwilling to give any and they're doing the same thing to lobster fishing.

One of the biggest industries in the State of Maine is under threat because of them but anyways, what I want to talk about is the reason that that land was made in 1867 to 1868, and I have the original report to the Secretary of the Department of -- to the Secretary of Agriculture describing in detail how the dike was made, why it was made, the fact that it created 330 acres of grassland and that many local farms use. I have the original leather-bound book that that's in, and in Washington County, we have woodland, we have blueberry land, we have a lot

of water, freshwater and saltwater. We don't have much grassland. Grassland is how we feed ourselves. Unless you're an absolute vegetarian, which finest kind, most of us eat meat. We like to be able to feed ourselves, Geary Albee raising cattle up there, hay, Chris Sprague, you've heard from these people. I don't stand to lose anything, I live down river but these are my friends, these are fellow farmers and if anybody thinks this is a joke, go to Hannaford, see what the price of beef is, see how much there is, see how empty the shelves are there. For local people to be able to feed themselves is important, it's important, and there's another aspect to that too, and that's deer. Washington County people love their deer. Believe me, they'll risk a lot to get a deer. I've witnessed that firsthand, and -- okay, I'll say one last thing and then I'll sit down and shut up. Fish, and I respect Dwayne Shaw, the work that he's done, Joe Robbins is the most knowledgeable Atlantic salmon fisherman there is, Charlie's brother fished for him from here to Russia. They're actually a sacred fish to me. My Celtic ancestors, they don't worship them but they look

at the salmon as a very special fish and I do, and I fished for them in three countries, I poured 29 years of blood and sweat into trying to keep them alive. I don't know as -- there may be only one other person in this room that's laid on the river all night watching a gill net or hide in the bushes watching someone trying to jig one when the black flies are so thick you can barely take a breath. So I'd like to say, don't talk to me about clamming, you know. How about, you know, Narraguagus, Pleasant, Machias, East Machias, Dennys, St. Croix? These are all good salmon rivers that don't have salmon, and we're worried about Middle River that never was a salmon river --

(Applause)

MR. CRAIG: Take a walk up river by there. The salmon would get sunburn trying to get up through, it's about that deep and rocky, you know. So the grass, the grass is a precious resource. If people were smart, they'd make dikes all up and down the coast. 330 acres of grassland is extremely valuable. It's valuable for farming but also that whole area is one of the most deer per square acre, we'll say, of any

place Down East and it feeds a big area too. Deer populate there, there's a lot of feed source there, they spill over into the surrounding areas and Maine people and Washington County people especially have identified deer as a high value thing.

So I -- I can't believe that, you know, we can do the things that we do with technology and things. I've got a device here I can talk to friends in New Zealand, you know, with no trouble at all but we can't figure out how to rebuild the dike and put nice new clappers in there? I don't believe it. Donnie Hanscom and an excavator, they'll take you down and they'll show you how to do it --

(Applause)

MR. CRAIG: You get some stone in there and put in some nice, fancy stainless steel, I'll kick in for them, you know. There's got to be some 2022 version clappers that could function. I realize there is -- something needs to be done. I'm with you. I'm glad that I came and heard what you had to say. I really am because you fellows are up against it too and you're getting clashed at a little bit but I think people are a

little more sympathetic where you're at in this. So I hope the takeaway is NOAA needs to be here, they need to hear this and let's strategize and see if we can figure this out for the people, the landowners, the grassland, the salmon, everything. Thanks.

(Applause)

MS. TAYLOR: Thank you. So we heard about the deer earlier so we are going to go back to Inland Fish & Wildlife and have some conversations, and I want to be clear, we know how to fix -- we can build some new boxes. That's not the issue. We can't get a permit from Army Corps to do exactly what's there now. That's where we stand right now.

UNIDENTIFIED SPEAKER: State comes before federal.

MS. TAYLOR: That is not our experience.

MR. ZAENGLE: My name is Fred Zaengle. I live up in Whiting off the Rabbit Lane. My wife and I are both chemists and we just moved up from Pennsylvania in September so I really admire the fact that everybody knows everybody and has been fishing with everybody and so on and so forth. We haven't been, but we're both chemists and when

you talk about disturbing a landfill, especially a landfill where you used to back up and dump, there's three things that come to mind, and one is mercury; two is lead; and three is DDT. I'm familiar with DDT in that I worked for a company that used to manufacture DDT. I worked in chemicals for 52 years, I worked for a company that used to manufacture DDT and when DDT was outlawed, all we could do was cover the ground with asphalt and dike it and leave it and that particular 14-acre property all outside of Philadelphia is a wasteland because there is nothing that could be done. So my point is, by messing with that dump, and I don't even know where the dump was but it's up there somewhere, by messing with that dump, we may be releasing more toxic chemicals into the ocean with the tidal flow. So have they looked at DDT, lead and mercury in the former dump?

MS. TAYLOR: That's next; that's next. Now that -- part of this is we started with what, 25 alternatives and we are down to two, so before you start spending serious money on an investigation, you've got to get your numbers down, and so now we're down to the one and

testing that dump counts for both the alternatives. So that's where we're at with starting a testing program.

MR. ZAENGLE: My question would be, if you find high levels of mercury and lead and even DDT in the dump, does that have any effect on the way you could remediate the dike?

MS. TAYLOR: Absolutely. I said previously, you know, if we -- and DEP will be involved -- can't contain the dump and we're going to cause more pollution, I don't see us moving forward with the bridge. That's not what we -- you know, what will happen is we either will close Route 1 and figure it out, we could even bridge the bridge. I've actually looked at bridging the bridge with my maintenance folks where we have some steel beams but you're not going to have trucks on it, you're going to lose a bunch of your vending area and a lot of your causeway if we do that. So that's basically going to make everybody really unhappy, but yeah, I mean, we're going to have to stop and go back to NOAA if that's the case.

MR. ZAENGLE: One other thing I heard on the news, and as I say, I'm new in the area so

maybe I'm wrong on this but I heard somebody from MaineDOT talk about sea level rise over the next hundred years and the fact that it's going to come up four feet over the next hundred years. I'll be happy to be here five years personally but 95 years from now, if I pass away, 95 years from now are you planning to change the elevation of the whole dike system or the bridge or how are you going to --

MS. TAYLOR: Right now, you know, a bridge has a hundred year life so we're going to look at the bridge. That's a commitment DOT has made. That four foot did not come from us, it came from a state technical science committee. Honestly, before we start raising the causeway itself, some people like Helen's are going to have to be splashed with some water for it to get real and so we've basically said we're not raising the roads right now and taking property and impacting people until it's a little more real.

MR. ZAENGLE: Thank you.

(Applause)

MR. MICHAUD: Tom Michaud. I represent the Causeway Commons Building with Dunkin' Donuts

and Pat's Pizza in it. I obviously have some concerns about what happens to the property erosion-wise, the well that we survive off from and the pressurized sewer line that serves everything on our side of the river that goes under the river. I'm curious to see what impact the channel change would have on that.

It's frustrating to see this process revolve around hunches on fish passage. I wish some studies could be done to prove one way or another what's passing and what's not and I'm curious if you could elaborate on NOAA's role in the permitting process.

MS. TAYLOR: So I have my professional assistant here in case I get this wrong but they don't give a permit. They consult through the NECO process and if they end up saying you can't do that alternative and they -- what they did with the existing condition that we tried to do is they used a word called jeopardy and if they use the word jeopardy, we have to take that alternative off the table and Army Corps cannot give us our permit which we need whether we use federal money or not with an Army Corps action. Did I get it right?

MS. CHAMBERLAIN: Yes.

MS. TAYLOR: Okay.

MR. MICHAUD: Has the DOT moved forward with other projects that haven't had NOAA sign off on them or labeled a project in jeopardy?

MS. TAYLOR: This is our first jeopardy project.

MR. MICHAUD: This is exciting. You have a chance to set a precedent here that sets us in the right space to move forward with this specific town's needs in mind. I'll leave it at that.

(Applause).

UNIDENTIFIED SPEAKER: So I got here a little bit late so I have a couple questions.

THE REPORTER: May I have your name, sir?

UNIDENTIFIED SPEAKER: I don't really want to.

THE REPORTER: Sir, may I have your name?

UNIDENTIFIED SPEAKER: I don't really want to.

THE REPORTER: Okay.

UNIDENTIFIED SPEAKER: So I'm a commercial fisherman. NOAA is very low for me, they're very low on everything. They've

destroyed shrimp, herring and I can keep going but I'll just leave it at that. So when we have two inches of rain in a 24-hour period, they shut the Machias River down all the way for clamming a bunch of places, red tide, pollution, pretty nasty stuff, clams are filter feeders. Lobsters dig into the mud and then -- well, we do have a precedent here because the bridge in Penobscot, they closed all above it to lobster fishing because of mercury, because of the heavy metals, because they said that it gave us a bad view on the lobster industry in the State of Maine. Nobody wants to eat a lobster with mercury in it. I don't fish that side but I've got a lot of friends that do and Hog Island is really far up, it's about four feet of water at low water, maybe three. Those lobsters will not be able to be caught. We're looking at the Penobscot River way more. Machias, I don't want to say it's really gross what they've done because they treat it but I'm not really a fan. The clam flats most of the way up past the historical building are not open, it's gross, no one wants to eat them. So if you increase what comes out of there, could you imagine how far down that impact would go? I

mean, you're talking a hundred clam diggers and probably 20 fisherman. It doesn't sound like a lot but those are families that need to be taken into consideration. Penobscot Bay, you can't scallop there because you might disturb the bottom, lobster fish there because you might disturb the bottom. Those people all had to move down out of that area. What happens is fishermen don't know where to punch at so they start punching each other and when you move down river you're now in someone else's territory. They'll cut you out, you'll cut them out, and everybody loses. So you're talking 20 fishermen turns into a hundred fishermen. It just keeps getting bigger and bigger and bigger.

I truly don't believe NOAA has got the interest of fish in mind on this one because look at Mohegans, pogies. They shut down the fishermen and I've never seen more fish in my entire life. Every river from Penobscot Bay up here is flooded and yet they claim there's no fish in the ocean. So you can't really say they care too much about a striper. So when you guys say they've got to try, well, they're catching striper there now. Those striper come right up

to the dike, them guys walk down and cast right off the little thing in front of Helen's and they catch 48-inch, 50-inch striper. So I don't really see why you need to go past that point. They're already coming up in, they're already feeding on pogies. What's the matter? So the amount of stuff that's going to flow down that river, not just the land that's going to be lost but you can go down there at low water and look at that place and it's not something you really want to swim in anyway, so I don't really see how increasing the flow would be better. So I don't know if -- how they got the Penobscot Bridge through, probably no one was paying attention, but this area doesn't want to be another Penobscot. People want to keep their ground, be left alone and I get that you're claiming the Army Corps can't do anything for a permit and I just don't see that either. I think it's political. I think that this has been -- how many years now have we been focused on this?

MS. TAYLOR: A long time.

UNIDENTIFIED SPEAKER: Exactly. I think it needs to be fixed, left alone and let people in Washington County dictate what happens in

Washington County because it's already bad enough as it is. Thank you.

(Applause)

MS. TAYLOR: Thank you. So in case you missed it, this is a preferred alternative but the two big things that I think we are still chasing is the landfill and the impact that the additional water would cause and it is the siltation and what happens. We have absolutely no interest in furthering and causing any closed clams flats. That is the point where we go back to NOAA and have a conversation.

MR. DOUGHTY: Anyone else that would like to speak?

MR. SHAW: Yeah, Dave had set the double dipping precedent. Dwayne Shaw with Down East Salmon Federation, and a question about some of the other causeways or tidal -- whatever you may want to call it, DOT has responsibility over the dike in Addison as well. It's my understanding, and you can correct me, but after about eight to nine years of studying, which the two towns of Columbia and Addison requested the Corps of Engineers to come in to assist the town -- I'm sorry -- DOT with an evaluation of hydrology and

all the various elements. Most recently DOT I believe announced that they intend to work with NOAA to open that system up.

MS. TAYLOR: That's not what happened.

MR. SHAW: Could you explain what's going on in Addison since it's such a parallel and many of us have kind of our feet in both watersheds?

MS. TAYLOR: Yup, with Addison, we, to be honest, just felt like we were not getting our money's worth out of the Army Corps study. It was going incredibly slow and so we have pulled out of it. We gave it to DMR and our message there is we are going to post the bridge and we'll close it if we have to at this point and, you know, I think there has been very little public process out there to talk to anybody about flooding and at this point I think that, you know, we are not the Department of Restoration. We're just not and we're in a very uncomfortable position in this meeting and I understand the desire for fish passage and restoration everywhere but our job is to keep people safe and our job is to make sure people can get from point A to point B and if that means closing the Addison Bridge, that's what we'll do and, you

know, that's not a nice message for people, it hasn't been said too much publically but we are posting it. We find that people -- now, if there can be a solution and you guys work with DMR and everybody is happy about it, I'm all in but right now we're trying to get through this project, and I can tell you, this is my experience is, you know, we have some other conversations going on where there's not Atlantic salmon in southern Maine and the regulations are not set up to flood property. The Army Corps does not -- they want to charge us mitigation here in Machias and we said we're not paying, are you kidding me, you're getting what you want. So I think that there's -- we've given it to DMR but we haven't weighed in that we're, you know, okay with taking it out yet. We're going to post the bridge and if we have to, we'll close it.

MR. SHAW: I've got friends and family that live on both sides of that and said the (indiscernible) just the approaches on a couple of sides are already dangerous. DOT is not -- I guess to put it bluntly, DOT seems to have been asleep at the wheel a little bit here because when I go by the telephone poles, they've got a

marker on them, this is six feet and if you drive down through there after a big rainstorm, you might end up in six feet of water, so there's an awful lot of going back to the amount of infrastructure where the money is going to come from to deal with these things, the public safety issues, the fishing issues. It's complicated. It's super complicated, and it's going to cost money and it's going to put people to work. There isn't unanimous opinion around what should be done in Addison and Columbia. I've been a resident of Columbia for many years. There's diverse opinions. The Greene family who had a farm there for generations advocated for 40 years to open those tide gates up, Lawrence Drisco, the local school principal for 80 some years, his lifetime, spanned some years, advocated for 50 years to open that up. So there's a diversity of opinions and there are laws and we're all faced with that.

MS. TAYLOR: Let me say it a little differently because that probably sounded too harsh. I guess what I'm saying is we're here in Machias because we have a public safety issue. That's what's driving a sense of urgency right

now to get to a solution. There's a different choice -- the choice to close Route 1 in Machias doesn't sound like a very good choice. Addison has a fairly short detour in comparison. If we have to do that, would it stink if you were the people who had to go around, yup, but at the same point, it's not the same road and that's what we have to look at. So we're looking at public safety. What I would encourage is -- we are not the people to go and convince all of these people that flooding is the best thing that ever happened. We don't understand it ourselves, right? We're in this position for public safety. That's what I'm telling NOAA and DMR they need to do in Addison. They need to carry the conversation. We can talk offline. Let's talk offline about Addison because that's not why we're here.

MR. SHAW: Sure, and the communities themselves need to wake up to a lot of these facts. The dump here in Machias, I dumped my trash there for years. It's a ticking time bomb. Somebody is -- at some point there's going to be a problem, whether it's already there and we have to come to understand how bad it is, but with the

hurricanes that are predicted, it's just a matter of time and we've got to get ahead of it and the Town of Machias should take it upon themselves to really look into this, not wait for a bridge to fail before you start thinking about the dump. The other one that I want to point out, and this is just -- I'm not asking for an answer but there is a causeway out to Beals' Island, to Eastport, it goes right through the Reservation, the Tribe is involved with the Corps and DOT and other agencies to look at opening that back up because the clam flats are dead because of the way that was filled without any flow of water at all. So there's a lot of this.

MS. TAYLOR: Yes, there is.

MR. SHAW: You all have your hands full.

MS. TAYLOR: Thank you.

MS. ATWOOD: My name is Valerie Atwood. Back in 2009, just so -- just two things that I want to say so that they're on the record -- was the first time that I attended a meeting up at the University on this Machias River dike. I'm the lady that gave the history. I'm more or less considered the local historian, and so we've been at this since at least 2009 and that was a public

meeting.

The second thing is that the reason the settlers came to Machias in 1763 was because of the salt marsh. There had been -- they had lived in Scarborough, there was a period of drought and forest fires in that area, they needed feed for their animals and they came down the coast looking for a place that they could get salt marsh or get hay and they found this salt marsh hay and this is why Machias was settled. Thank you.

(Applause)

MS. WOOD: Hi, my name is Stephanie Wood. I am a property owner in Marshfield. I wasn't going to speak until Valerie mentioned the marsh hay piece. This has been a long time, it's exhausting repeating the same thing over and over but just so people know, my husband along with many -- Geary and the Getchells and the Bowkers, all in Marshfield harvest the hay that she's talking about, so what we stand to lose right now with the flooding, we will lose at least 1,500 bales of hay a year at $5 a bale. I looked up there and I saw the Getchell Boys' sign. Those boys are part of this harvesting as well. So

that's what we're standing to lose. It's more than the salmon.

(Applause)

MS. TAYLOR: Thank you.

MR. BOWKER: How you doin'? Dan Bowker, I'm a landowner. I'm going to lose a hundred percent of my land down there which historically was used for the hay they're talking about. I am one of the Bowkers that had been taking hay off there since I was -- I was a lot shorter than the hay was definitely. I've been doing it all my life down there. It's definitely a livelihood. The one thing that I'm going to ask -- I'm going to put three organizations on the spot. I want to ask the three organizations here that are representing the salmon people that are for the full bridge, I would like them to come forward and say that they actually would like to get rid of our livelihood which basically was created -- it's the reason Machias was created. I'd like to put them on the spot and ask them to come up and individually as a representative of the group they're representing for the bridge say they would like to get rid of our livelihood, our land for the salmon. They're the ones saying it for

the salmon. We've proven that the salmon go through the clappers. I can remember as a kid down there with my father trout fishing, some of the best trout fishing. There used to be a trout hatchery on that land, it was on my family land, there was always a trout hatchery on that. So I'd like them to come forward and as a representative of their group, they're here representing their group tonight, say that they want to get rid of our livelihood for salmon. Thank you.

(Applause)

MS. RICE: Hi, I'm Hannah Rice. I grew up in Marshfield, I actually still live there now. The house that I grew up in is the house that you see in every rendering, every picture of the project, any picture of the dike pretty much my house that I grew up in is right there. When I was in high school, I actually had a picture of my parents' house on the wall in my classroom where my teacher talked about wanting to flood and destroy my parents' land back then and that was with (indiscernible). Anyway, I want to talk a little bit about the place that I grew up and about this community and also one of the things

that I think is a huge word that comes to mind when you think of Washington County is self-sufficiency. People here like to be able to go and clam and we consume most of the clams that are clammed here, they hay, they have cows, my family has chickens, so we don't buy eggs at the store or you can get them from a friend who has a farm or whatnot. You can pretty much buy anything that you need for food-wise here or you can hunt for it. I know I've shot a couple of deer out there in that area that is pictured behind the dike. My dad did that for years too. Now he lets my sister and I shoot the deer so that's kind of nice of him. Yeah, so I think self-sufficiency is a huge thing here and when you take away something that is as huge as the dike is to all those landowners, to potentially the clammers, the lobster fisherman, we've got a lot of different industries that would be impacted here. This area is a small community and our economy is small. So when you affect some of those big industries for this area, that has a huge, huge impact not only on those who have land but also on all those people that we know that we go and get lobster from or we go and

get clams from or we go to their little farm stand and get their baked goods or whatever. It affects all of those people and growing up here, it's been heart breaking to watch for years since I was in high school, my dad being jerked back and forth, they're going to take out the dike, they're not going to take out the dike, they're going to take out the dike, they're not going to take out the dike, and that's been heart breaking to watch and so in some ways I really appreciate that, you know, you've picked one option because then you're like, well, I guess this is the worst possible thing that could potentially happen and it illuminates some of that and so I do appreciate that and I appreciate what you guys are doing in taking the time to listen to us and everything and talking to us today and I do think a lot of the frustrations that people have had aren't necessarily as directed at you as you may have felt today because I think we've had this being pushed at us for years and shoved down our throats and if this is what we need to do all for the salmon, that is very frustrating because our economy here really is not contingent upon salmon. Conservation is something that is very

important to everybody here because our industries and our livelihoods are contingent upon conversation. If you ruin clam flats, that's a huge industry. If you ruin lobster fishing, that's a huge industry. If you take away marsh hay, that affects the food people have on their tables. It is a big issue and it may be something that in other places it's not that much of an impact but because we are so small and because we are so self-sufficient here, when you take away something that inhibits how self-sufficient we can be, it cripples this area and our economy and our people and that's really hard. I know in my backyard the other day we were watching a bunch of fawns run around, we have seven deer that have fawns every year and they live right out there in the marsh. As a kid when I'd be getting ready for soccer in the fall and I'd go to run, I'd run the trails and I'd always end up having a heart attack because the deer would jump out and I'd be like, (startled sound). I was already out of breath enough, but, you know, the amount of animals and wildlife, we see foxes and muskrat and beaver and I could go on and on and on and some of the animals that

live there I think are actually endangered. We are kind of like, oh, I wonder what that is, and you get out the binoculars and you come across it and whatnot but as people here, we love to fish. I would love to see fish in the river. That river, Middle River, actually has a kids only fishing area up the river and I think Julie mentioned her grandkids fishing up there as well and I remember going up there as a kid with your kids (pointing) fishing and that was fun and that's one of the big things about conservation that I think people miss is you also want to teach people to love the things they're conserving. You want them to love where they are and love that land and the fish and love to go fishing, and those things -- you know, the locals here, we love that, we want to preserve that and conserve that and keep it as nice as it is, and I think when you have something introduced that's not there and thriving like the salmon that comes in and that's going to take precedence over all those things that we all love and have now and you're saying we hope we get salmon, we hope we have this. Well, we love what we already have. We love the deer and the hay and the clams and

the lobster and all those things that are already thriving. So the idea that even -- I'm not saying that you guys would mess it up but if you built a bridge and somehow you didn't do something correctly or you did something where you tested and it wasn't tested right and stuff did ruin those things on accident because I've heard of those kinds of things happening a lot because we're all human and we make mistakes but, you know, if that puts those things in jeopardy or at risk, that's heartbreaking for us because this is our home, this is where we live and we love the area that we live in and the things that make us the community we are are those things. Thank you.

MS. TAYLOR: Thank you.

(Applause)

MR. SPRAGUE: My name is John Sprague. I live in Marshfield. That was my granddaughter. Don't you think we look a lot alike? I feel I owe you people an apology because I come out as very combative. In my life situations I've been in I've had to debate an awful lot of things. The frustrating thing about this whole thing is I've set at every meeting they've ever had. We

were told they were going to fix the clappers. Praise the Lord. And guess what? We came back to this again. And then they told us they're going to fix the clappers and they were going to start fixing them in '23 I believe it was and here we are again. Please do the studies that you need to, show that that river was never a salmon river, show that the clappers allow fish to go up there and if you flood those lands, the poison is going to be unreal and let Machias be Machias, okay? I apologize if I offended you.

MS. TAYLOR: You do not need to apologize, sir.

(Applause)

MR. DOUGHTY: Not at all. None of you do. If it were my community, I would be on that side of the table. This is very valuable for us. I think we'd like to maybe end this portion but stick around a little bit and have a conversation. Probably some of us will start picking up but we'll be here for awhile. We have some other subject area experts with us today and so if you have a question, you may engage some of them. So please come up and chat with us if you'd like.

MS. TAYLOR: Can the DOT people just hold up your hands if you're off to the sides just so you guys can get a sense of who they are.

MR. DOUGHTY: We also have some consultants who can also raise their hands as well.

MS. TAYLOR: I just want to thank you. I know this is incredibly difficult and I really appreciate that you turned out and told us things that we don't know, we heard some things and this is what the process is for, for us to listen, to explain and to go back and think about how we can figure this out. So thank you very much.

MR. KITCHEN: And I would like to thank everyone for showing up and for sharing. I know that was not easy, and thanks to DOT for being candid and for listening. There's a lot of things that obviously they haven't heard before. On that subject, I would urge everyone, because a lot of us will walk out of here and think of things that we wish we had said. Please put them in writing, share them directly with DOT, you can certainly get them to the town office and we will forward them but don't miss this opportunity and we'll continue to push to get NOAA here. Thanks,

everyone.

(Whereupon, the above-named hearing was concluded at 7:03 p.m.)

CERTIFICATE

I, Joanne P. Alley, a Notary Public in and for the State of Maine, hereby certify that the foregoing is a true and accurate record as taken by me by means of computer-aided machine shorthand.

I further certify that I am a disinterested person in the event or outcome of the aforementioned cause of action.

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of July, 2022.

_____

Joanne P. Alley
Court Reporter/Notary Public
My commission expires: July 17, 2029

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