Agenda Item:

TOWN OF TRURO

Select Board Agenda Item

DEPARTMENT: DPW

REQUESTOR: DPW Ad Hoc Building Committee Chair & Jarrod J. Cabral DPW Director

REQUESTED MEETING DATE: September 25, 2025

ITEM: Discussion and possible vote for the future Public Works Facility base bid and bid alternate selection order. This item will also include a project update.

EXPLANATION: For the Future Public Works Facility, the Ad Hoc Building Committee Chair will provide a recommendation on an overall base bid and bid alternate selection order. Staff and consultant will also give a brief update on the project and review the overall project schedule.

FINANCIAL SOURCE: N/A

IMPACT IF NOT APPROVED: Bid documents will not be developed

SUGGESTED ACTION: MOTION TO the Chair to authorize the Town Manager, the Ad Hoc Committee and Town staff to continue work on the Future DPW Facility final design and bid documents.

ATTACHMENTS: Ad Hoc Committee recommendation memo
W&S Sep 4th, 2025, Ad Hoc Committee update with Backup
W&S Total project costs for each scenario

TOWN OF TRURO

P.O. Box 2030, Truro, MA 02666
Tel: 508-349-7004, Fax: 508-349-5505
Department of Public Works

To: Members of The Select Board
From: DPW Ad Hoc Building Committee
CC: Kelly Clark, Town Manager
Jarrod J. Cabral, Public Works Director
Alex Marini Lessin, Finance Director
Date: September 25, 2025
Subject: DPW Ad Hoc Building Committee

The DPW Ad Hoc Building Committee began its work to review the square foot requirements, schematic design estimates, design development, along with current project costs on June 18th, 2025. Our goal as a committee is to provide the most cost effective and efficient operation that can also extend the useful life of equipment while also improving employee safety. After monthly meetings with our Committee Members, Town Staff, and Town consultants, with a majority vote, we are pleased to recommend the base bid and bid alternate selection order as follows.

The base recommendation is comprised of Administration, Building Maintenance, Fleet Maintenance, and Wash Bay areas totaling 11,145sf. The base bid also includes fleet storage consisting of 7,800sf, and the mezzanine areas at 2500sf, for a grand total of 21,445sf. The bid alternate order consists of bid Alternate #1 5,000sf Fleet storage and bid Alternate #2 4050sf standalone enclosed canopy.

When considering the cost benefit analysis presented on September 4th, 2025, at the Ad Hoc Committee meeting, the net cost and value to the Town is the same for all scenarios.

Thank you,

Bob Higgins Steele, Chair DPW Ad Hoc Building Committee
Leif Hamnquist, Vice-Chair DPW Ad Hoc Building Committee

TOWN OF TRURO

NEW PUBLIC WORKS FACILITY



Project Update

September 4, 2025

PROJECT HIGHLIGHTS

COMMUNITY BENEFITS OF THE DPW & PWS WELL PROJECT

- New Facility for DPW Operations (various design scenarios)
  - To Meet Town's Goals as a Stretch Energy Community
- New Salt Shed for DPW Operations
- New Generator to Support DPW Operations
- Stormwater Drainage System
- Geothermal Well Field
- New Drinking Well for DPW and Town Hall
- New Septic System for DPW and Town Hall

FULL SCHEDULE

WE ARE HERE

PHASE	Study	Concept Design	Schematic Design	REVIEW PERIOD	Design Development	Construction Documents	Bidding
Start Date	✓	✓	March 1, 2025 ✓		End of July 2025	Early November 2025	Mid February 2026
Deadline	✓	✓	May 30, 2025 ✓	✓	End of October 2025	End of January 2026	

- Review Bids
- Warrant Recommendation
- Town Meeting; May 2
- Election; May X

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SINCE LAST AD HOC MEETING; JULY 31ST

PROJECT UPDATE

- ☑ Reengage with Cape Light Compact regarding Utility Incentives
- ☑ Progress on PWS Well; Discussions with DEP & Driller
- ☑ Progress on Fire Protection Cistern and Pump Room Design
- ☑ Progress on Coordinating Building Systems, Structural, and Industrial Equipment
- ☑ Follow up with Industrial Equipment Team and Mechanics / Shop Personnel
- ☑ Progress on Coordinating Industrial Equipment Utilities
- ☑ Progress on Laying Out Geothermal Wellfield
- ☑ Site Plan Review w/ Users

COMMITTEE Q & A

RESPONSES TO COMMITTEE Qs:

Recommended Milestones for Ad Hoc Committee

- Advocacy & Education Outreach - presentations, flyers, display boards, etc.
    - W&S can help provide graphics, info, etc.

Electrical load and solar production potential for Energy Committee analysis

- Annual Electrical Load:
    - 61,000 kWh (HVAC)
    - _____ kWh (industrial equipment)
- Annual PV Production:
    - See snippet to the right from May Ad Hoc Committee Project Update

SOLAR PHOTOVOLTAIC (PV) SYSTEM SUMMARY				
	SYSTEM A	SYSTEM B	SYSTEM C	NOTES
MODULE QTY	150±	150±	48±	348±
MODULE POWER	550 WATT	550 WATT	550 WATT	---
DC NAMEPLATE	82.5± KW DC	82.5± KW DC	26.4± KW DC	191.4± KW DC (TOTAL)
INVERTER QTY	2	2	1	---
INVERTER RATING	25 KW & 36 KW	25 KW & 36 KW	20 KW	---
AC NAMEPLATE	61± KW AC	61± KW AC	20± KW AC	142± KW AC (TOTAL)
SYSTEM AZIMUTH	241°±	61°±	61°± / 241°±	BLDG. ORIENTATION
SYSTEM TILT	1/2" / 1'-0"	1/2" / 1'-0"	3" / 1'-0" & 1/2" / 1'-0"	FLUSH (ROOF PITCH)
RACKING	RAIL/CLAMPED	RAIL/CLAMPED	RAIL/CLAMPED	---
ENERGY PRODUCTION	±90 - ±110 MWH/YR	±85 - ±105 MWH/YR	±25 - ±35 MWH/YR	±200 - ±250 MWH/YR

200 mWh = 200,000 kWh

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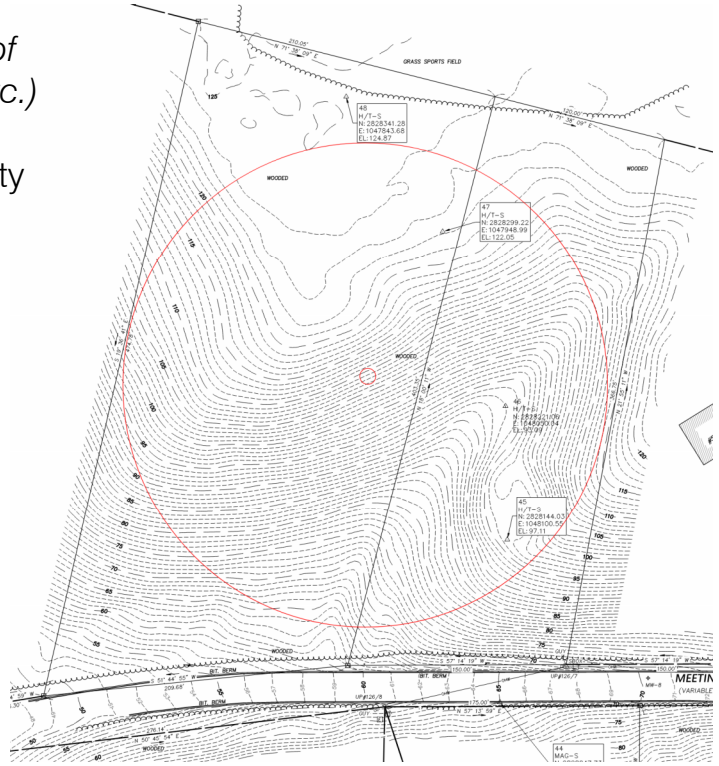
COMMITTEE Q & A

RESPONSES TO COMMITTEE Qs:

Status of the proposed well for Town Hall Hill coming from Trust property and of the process (development costs, lease, drilling, sampling, piping to the site etc.)

- PWS Well & distribution costs: $420k placeholder (treatment needs TBD)
  - For Protection Radius to stay within parcels, the well has a capacity of +/- 2,500 gpd at 2 gallons/minute
- Potential recommendation: a second, non-potable well for FP cistern
  - In lieu of tanker trucks refilling the 27,000 gallon cistern
    - $900/6,000 gallon tanker x 5 tankers = $4,500 a session
  - Could also support wash operations, hose bibs, and toilets (reducing domestic, potable water demand on the PWS well)
  - An additional $100-150k
- Lease: license agreement 1-pager for design/drilling; easement TBD
- Drilling: awaiting driller quote; asap, simultaneously with WS 13
- Sampling: following the drilling
- WS 13 Application (review could take up to 72 days)
- WS 15 Application to follow asap after sample evaluation report (review could take up to 72 days)
- Once permitting completed/approved, finalize distribution design



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COMMITTEE Q & A

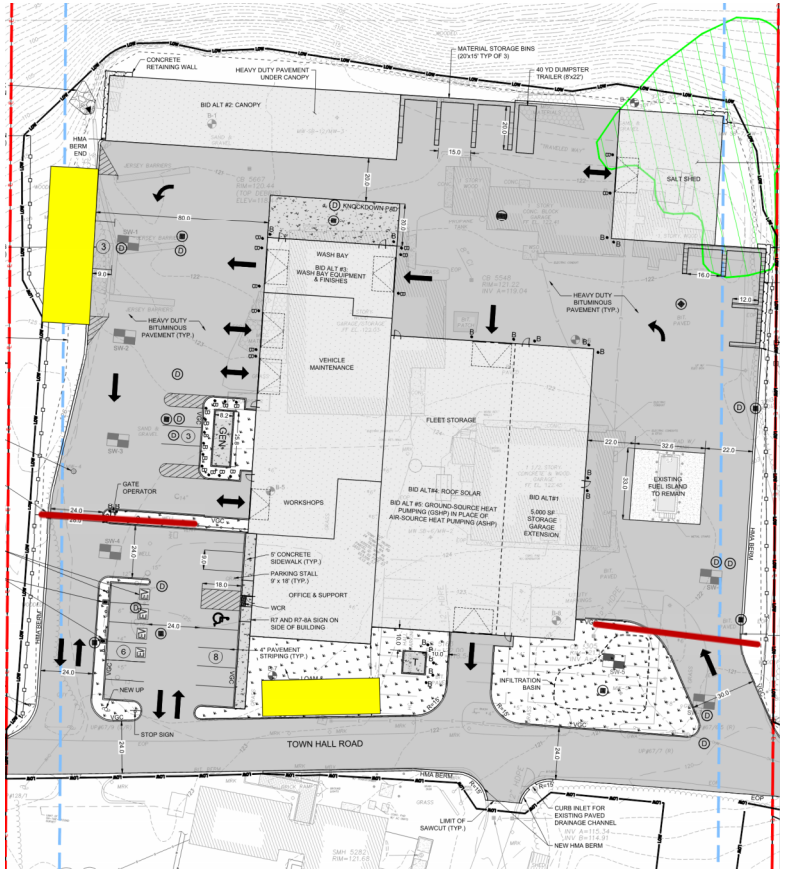
RESPONSES TO COMMITTEE Qs:

Exterior site plan overall, pros and cons to include parking, landscaping, fencing and any proposed changes to what's been presented.

- Current site design includes: parking, fencing, security gates, grass frontage (with stormwater infiltration basin)
  - Additional parking recommendation (shown yellow)
  - Landscaping / plantings recommended along Town Hall Road

Radiant heat scope – all covered space? Cost savings in reduced radiant?

- Current scope: only fleet maintenance
  - Some towns have asked for it at knock-down pad, but not in current design
- Efficient performance given space & combo with GSHPs
  - Heating the air not efficient with the large volume and garage door openings



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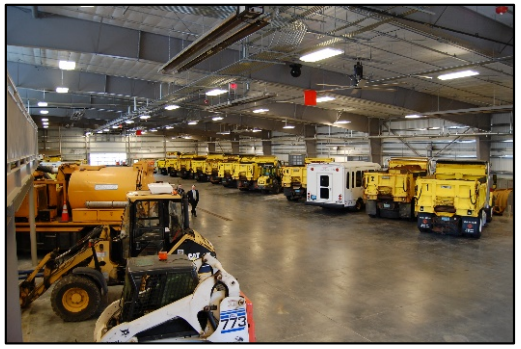
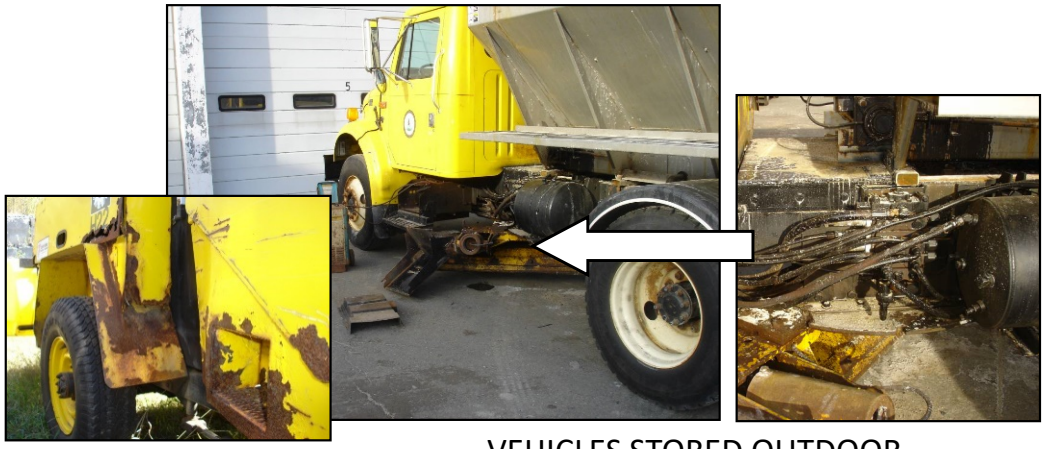
COSTS ASSOCIATED WITH OUTDOOR STORAGE

BOURNE DPW'S STORAGE GARAGE



COST CRITERIA

- ❑ Additional Fleet Maintenance Costs
- ❑ Fleet Life Expectancy Reduction Costs
- ❑ Non-Productive Labor Costs
- ❑ Engine Block Heater Usage Costs
- ❑ Environmental Impacts Cost
- ❑ Employee Safety Costs
- ❑ Backlog in Preventative Maintenance



VEHICLES STORED OUTDOOR

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TRURO DPW'S FLEET INVENTORY

WSE ID #	TOWN ID #	DIVISION	MODEL TYPE	MAKE / MODEL
2		DPW	TRACTOR	PETERBILT
3		DPW	TRUCK	INTERNATIONAL 7400
4		DPW	DUMP TRUCK	INTERNATIONAL 7400
5	T-3	DPW	PICK UP TRUCK	FORD F450
6		DPW	DUMP TRUCK	FORD F450
7	T-6	DPW	PICK UP	FORD F350
8	S-1	DPW	PICK UP	FORD F350
9		DPW	DUMP TRUCK	
10	T-8	DPW	PICK UP	FORD F-350
11	T-4	DPW	PICK UP	FORD F350
12	T-2	DPW	PICK UP	FORD F350
13	T-9	DPW	PICK UP	FORD F350
14		DPW	PICK UP	FORD F350
15		DPW	PICK UP	
16		DPW	SWEEPER	ELGIN
17		DPW	EXCAVATOR	JOHN DEERE 130G
18		DPW	LOADER	JOHN DEERE
19		DPW	LIFT	JLG 600S
20		DPW	GENERATOR BOX TRAILER	
21		DPW	GENERATOR TRAILER	
22		DPW	WOOD CHIPPER	BANDIT
23		DPW	TRAILER	TIMPTE
24		DPW	TRAILER	CAM
25		DPW	TRAILER	KAUFMAN
26		DPW	TRAILER	INTERSTATE
27		DPW	TRAILER	BENCE
28		DPW	TRAILER	

WSE ID #	TOWN ID #	DIVISION	MODEL TYPE	MAKE / MODEL
34		DPW	RIDE MOWER	JOHN DEERE
35		DPW	EQUIPMENT	HYSTER
36		DPW	SKID STEER	JOHN DEERE 323E
37		DPW	RIDE MOWER	TORO
38		DPW	RIDE MOWER	TORO
39		DPW	RIDE MOWER	BOB CAT
41		DPW	PUSH MOWER	
42		DPW	PAINT MACHINE	
43		DPW	POWER WASHER	
44		DPW	WALK BEHIND SAW	EDCO
45		DPW	LIFT	JLG
47		DPW	MOWER	TIGER
48		DPW	WING PLOW	
49		DPW	WING PLOW	
50		DPW	WING PLOW	
51		DPW	STANDARD PLOW	
52		DPW	STANDARD PLOW	
53		DPW	STANDARD PLOW	
54		DPW	STANDARD PLOW	
55		DPW	STANDARD PLOW	
56		DPW	STANDARD PLOW	
57		DPW	STANDARD PLOW	
58		DPW	STANDARD PLOW	
59		DPW	PLOW (ORANGE)	
60		DPW	LOADER PLOW	
61		DPW	LOADER PLOW	
62		DPW	SANDER BODY	
63		DPW	SANDER BODY	
64		DPW	SANDER BODY	
65		DPW	FORKLIFT	

TYPE	COUNT
LARGE VEHICLE	5
MEDIUM VEHICLE	2
SMALL VEHICLE	8
LARGE EQUIPMENT	3
MEDIUM EQUIPMENT	0
OBLONG EQUIPMENT	0
SMALL EQUIPMENT	8
X-SMALL EQUIPMENT	6
MISC. EQUIPMENT	0
ATTACHMENT	26
TOTAL	**58**

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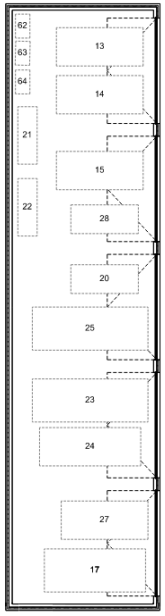
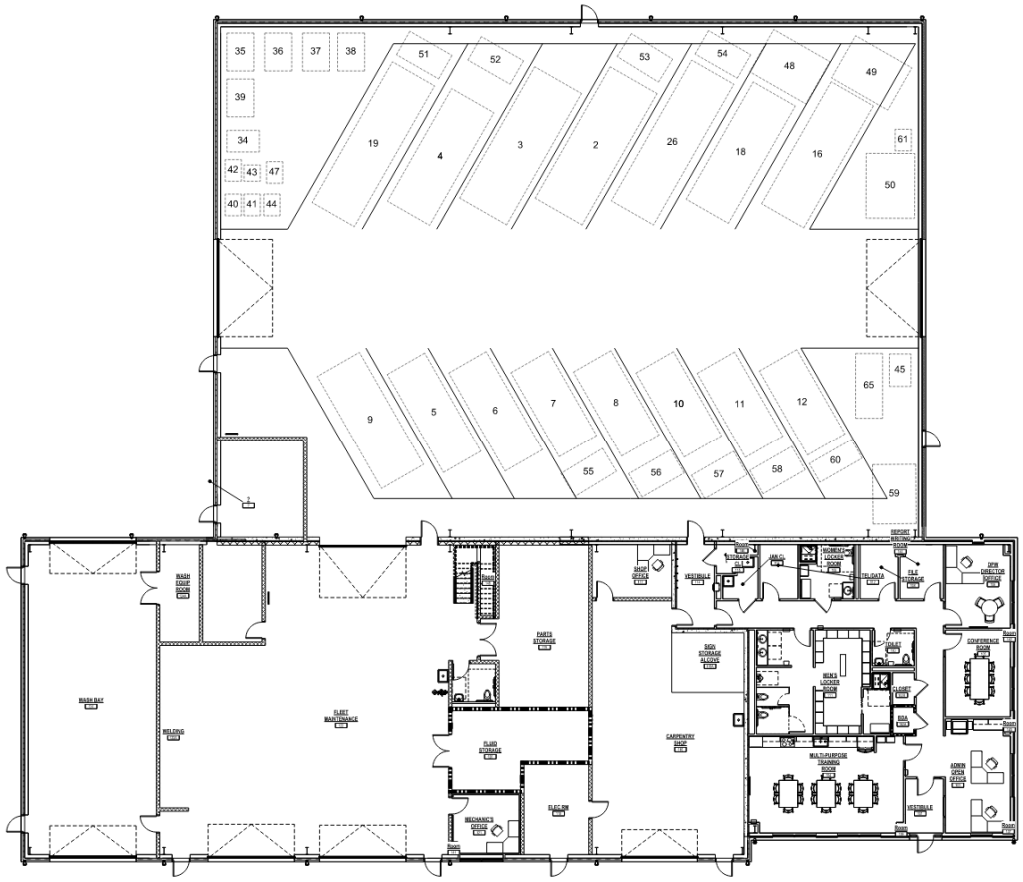
FULL BUILD OUT

SCENARIO 1





- OPTIMAL RESPONSE TIME, EFFICIENCY, AND SAFETY
- ALL OPERATION BAYS LEFT OPEN FOR USE
- NO ADDITIONAL COSTS ASSOCIATED WITH FLEET STORED OUTSIDE

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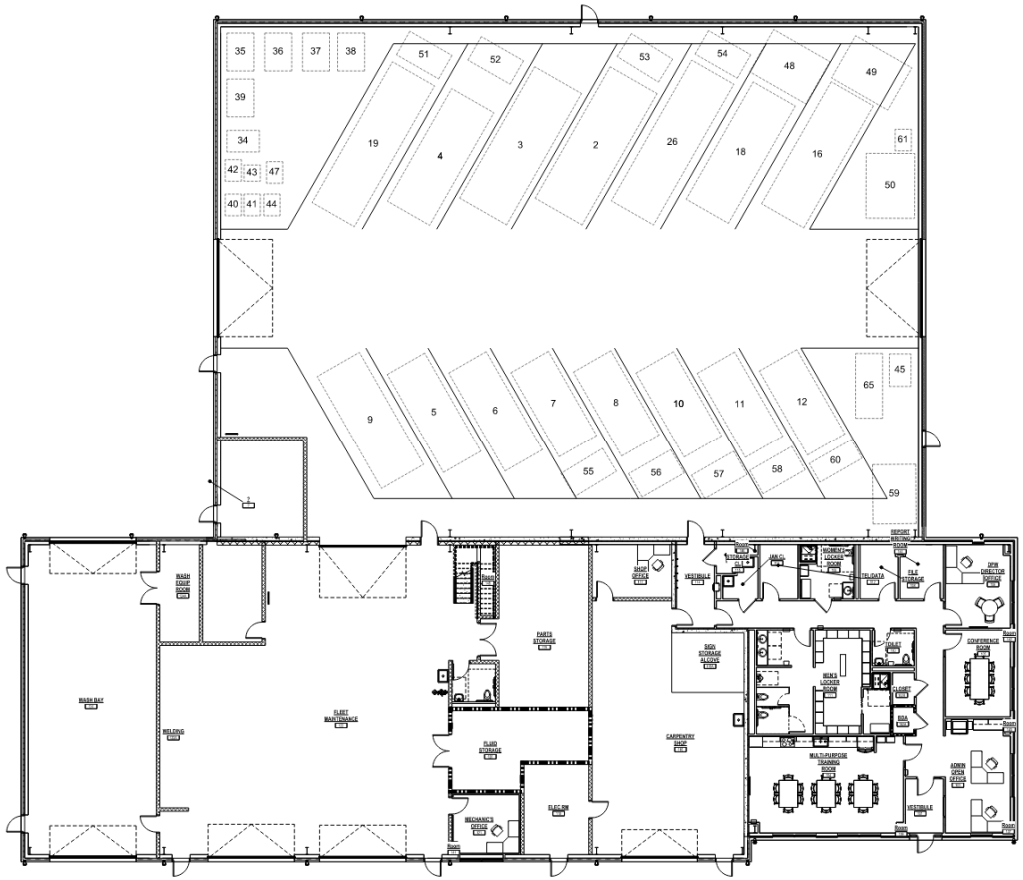
BASE + 12,800 SF GARAGE

SCENARIO 2



[OVER A 50 YR PERIOD]
Costs Associated with Storing Outside:
15 Fleet Items = $ 4.8 M

- ALL OPERATION BAYS LEFT OPEN FOR USE

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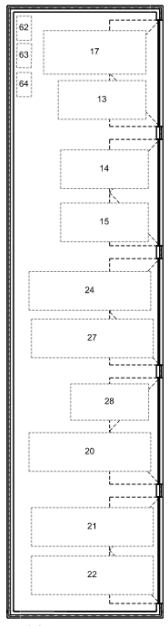
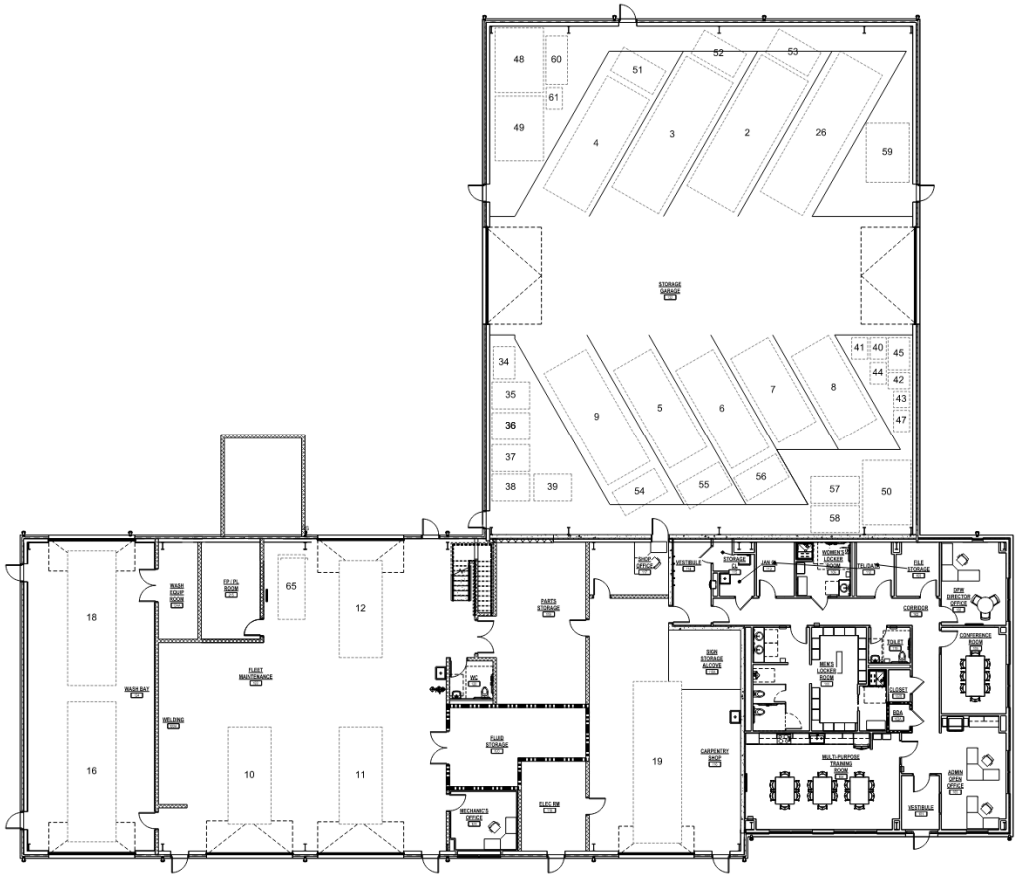
BASE + COLD STORAGE + 7,800 SF GARAGE

SCENARIO 3





[OVER A 50 YR PERIOD]
Costs Associated with Storing Outside:
2 Fleet Items = $ 786,000

- ITEMS STORED IN OPERATIONAL BAYS, IMPACTING EASE OF USE

Cost Associated with Storing the 6 Fleet Items Outside = $ 2.7 M

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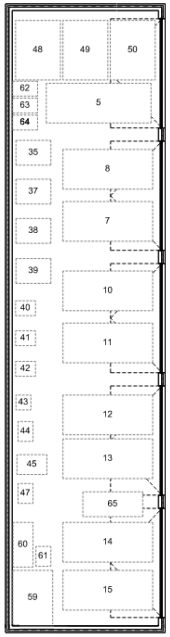
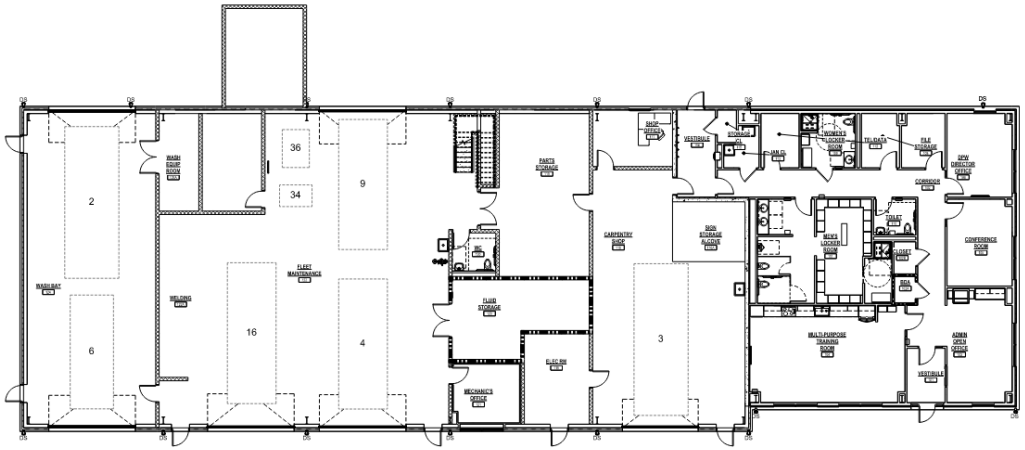
BASE + COLD STORAGE BLDG

SCENARIO 4





[OVER A 50 YR PERIOD]
Costs Associated with Storing Outside:
20 Fleet Items = $ 5.3 M

- ITEMS STORED IN OPERATIONAL BAYS, IMPACTING EASE OF USE

Cost Associated with Storing the 6 Fleet Items Outside = $ 2.7 M

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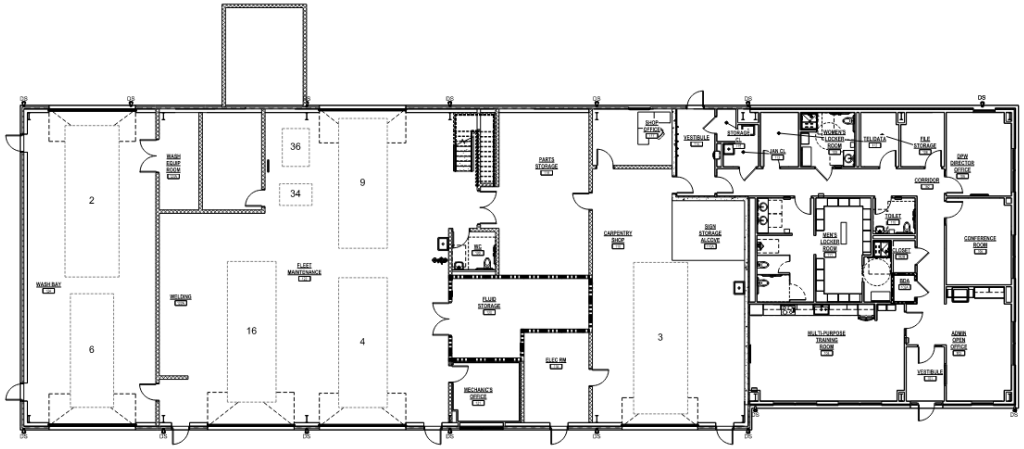
BASE BID

SCENARIO 5



[OVER A 50 YR PERIOD]
Costs Associated with
Storing Outside:
50 Fleet Items = 12.1 M

* ITEMS STORED IN
OPERATIONAL BAYS,
IMPACTING EASE OF USE

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SCENARIO COST-BENEFIT OVERVIEW

[OVER 50 YR PERIOD]

SCENARIO	DESCRIPTION	OUTSIDE FLEET COSTS	BUILDING COST INCREASE	LCCA
1	**FULL BUILD OUT**	$ 0	$ 10 M	**$ 10 M**
2	**BASE + 12,800 SF GARAGE**	$ 4.8 M	$ 7.1 M	**$ 11.9 M**
3	**BASE + COLD STORAGE + 7,800 SF GARAGE**	$ 786k / $ 3.5 M *	$ 7.2 M	**$ 8.0 M / $ 10.7 M ***
4	**BASE + COLD STORAGE**	$ 5.3 M $ 8.0 M *	$ 2.9 M	**$ 8.2 M / $ 10.9 M ***
5	**BASE BID**	$ 12.1 M	$ 0	**$ 12.1 M**

* Plus another $ 2.7 M if the 6 Fleet Items are moved outside to free up the operational bays.

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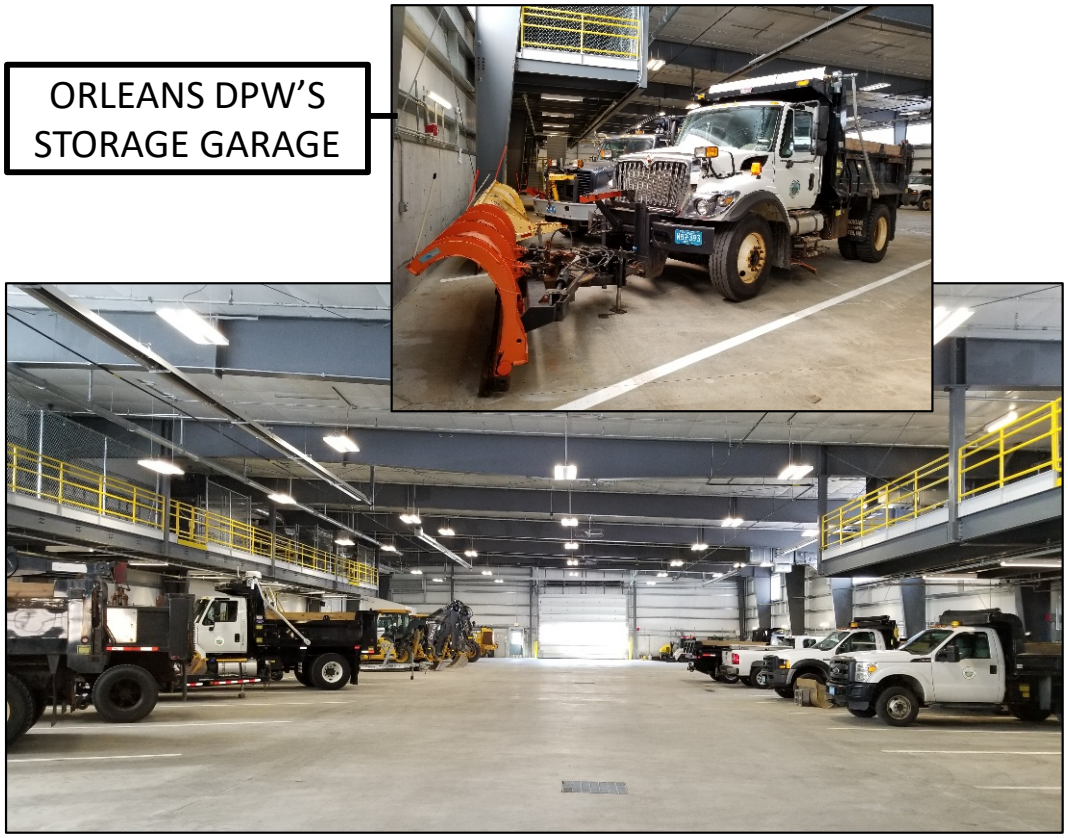
RECAP: WHY STORE FLEET INDOORS?

- Provide Cost-Effective & Efficient Operations
- Extend the Useful Life of Equipment
- Improve Employee Safety
- Improve Public Safety
- Stormwater Pollution Control
- Noise & Air Pollution Control

ORLEANS DPW'S STORAGE GARAGE



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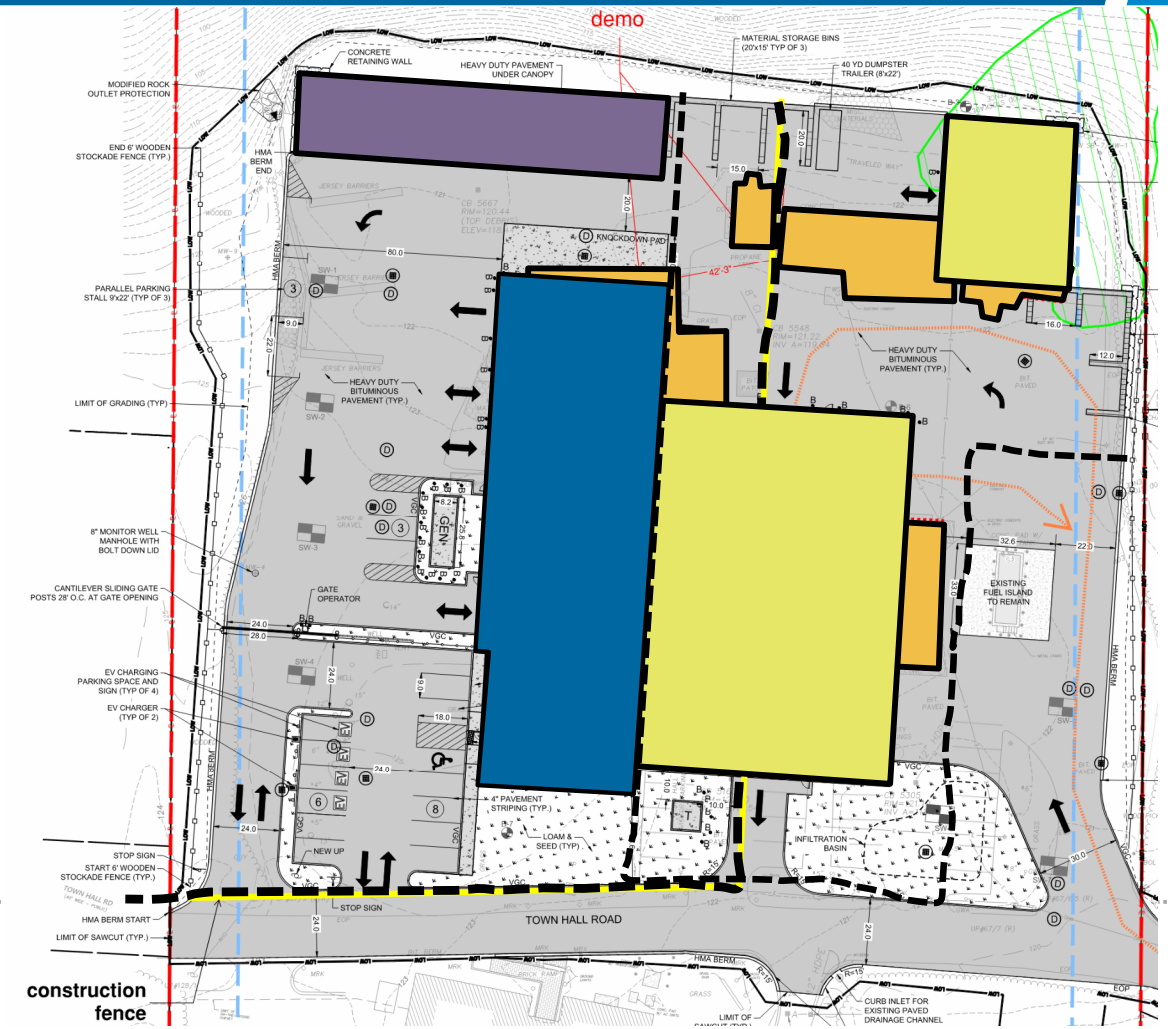
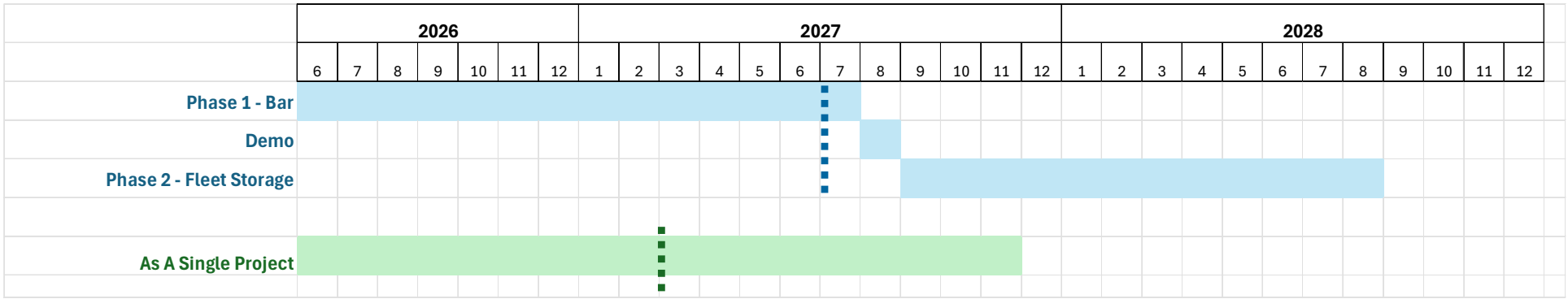
PHASED CONSTRUCTION



PHASED VS. SINGLE



9 MONTHS – GENERAL CONDITIONS @ $125K/MONTH	$ 1,125,000
4 MONTHS – ESCALATION TO MID POINT OF CONSTRUCTION (1%)	$ 266,700
TOTAL COST IMPLICATIONS OF PHASED CONSTRUCTION	$ 1,391,700

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2-MONTH LOOK AHEAD (DD)

- ❑ Progress on PWS Well & Main;
- ❑ Progress on Geothermal Well Field Design; Test Well Timing / Coordination
- ❑ Meet with Owner to review IT/Security/Access Provisions; Scheduled for 9/12
- ❑ Coordination with Eversource
- ❑ Continued Geotechnical Investigation
- ❑ Progress on Septic System Design
- ❑ Progress on Fire Suppression Cistern & Pump Design
- ❑ Meet with Fire Department
- ❑ Continued Salt Shed Coordination
- ❑ Permitting; Planning Board, Historic Review Board / Historic Commission

transform your environment

current base; 11,145 sf

Town of Truro
Department of Public Works
BASE BID + SECONDARY STORAGE BUILDING
Cost / Benefit Analysis Summary

8/20/2025

Item	Description	Cost Over the Life of the Building (50 Years)	Net Present Value
1	Construction Cost of a New 4,050 SF Storage Garage	$ 2,130,000	$ 1,975,742
2	Building Maintenance Costs	$ 830,880	$ 663,620
3	Heating, Ventilation, and Electrical Costs	$ 388,468	$ 317,894
	Total Costs Associated with Building and Maintaining a Storage Garage:	**$ 3,349,349**	**$ 2,957,255**
4	Additional Vehicle Maintenance Costs Associated with Exterior Storage	$ 1,012,405	$ 788,368
5	Additional Costs Associated with Vehicle Life Expectancy Reduction	$ 2,183,555	$ 1,745,895
6	Site Development Costs for Exterior Storage	$ 266,680	$ 247,366
7	Exterior Storage Area Maintenance Costs	$ 1,281,969	$ 1,006,017
8	Cold Weather Costs for Vehicles Stored Outdoors (non-productive labor)	$ 166,667	$ 131,562
9	Storm Event Costs for Vehicles Stored Outdoors (non-productive labor)	$ 141,177	$ 111,441
10	Engine Block Heater Usage Costs	$ 33,826	$ 26,701
11	Security Loading & Unloading of Vehicles (non-productive labor)	$ 791,453	$ 624,750
12	Vehicle Staging Non-Productive Labor Costs	$ -	$ -
13	Reduced Employee Safety Costs	$ 57,560	$ 45,436
14	Environmental Impacts	$ 564,362	$ 430,523
15	Increase in Vehicle Maintenance Costs Due to Delays in Preventative Maint.	$ 147,678	$ 116,573
	Costs Associated with Storing Vehicles Outdoors:	**$ 6,647,332**	**$ 5,274,631**
	Additional Costs Incurred By the Town if Vehicles and Equipment are Stored Outdoors:	**$ 3,297,983**	**$ 2,317,376**

Note: Costs associated with reduced public safety due to delays associated with outdoor storage have not been included in this analysis

Net Present Value (NPV) Discount Rate:	0.80%

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 1 - Vehicle Storage Garage Cost
2025

*Provided By Owner

AMOUNT FINANCED	DEBT SERV. YEARS *	ESTIMATED INT. RATE*
1,500,000	20	4.00%

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 2 - Building Maintenance Costs

Average Employee Rate with Benefits $ 51.03
Avg Annual Inflation Rate 3.0%
Benefits Adjustment

		LABOR				PARTS		TOTAL			
Building Maintenance Activity	A Frequency per year	B Average Maintenance Manhours per Occurrence	C Total Manhours per Year (A x B)	D Loaded Rate	E Total Labor Cost per Year (C x D)	F Parts Cost per Occurrence	G Total Parts Cost per Year (A x F)	H Total Labor & Parts Cost per Year (1st Year) (E + G)	I Total Cost Over 20 Year Period	J Total Cost Over Life of Bldg (50 Years)	Net Present Value
Yearly Preventative Maintenance Service	1	8	8	$ 51.03	$ 408	$ 250	$ 250	$ 658	$ 17,687	$ 74,247	$ 58,609
Change Light Bulbs	2	8	16	$ 51.03	$ 816	$ 100	$ 200	$ 1,016	$ 27,313	$ 114,656	$ 90,506
Unscheduled Repairs	2	16	32	$ 51.03	$ 1,633	$ 500	$ 1,000	$ 2,633	$ 70,749	$ 296,990	$ 234,435
Replace Roof	One Occurrence @ year 25		--	--	--	--	--	--	--	$ 82,328	$ 67,998
Repaint Exterior Items	0.20	80	16	$ 51.03	$ 816	$ 100	$ 20	$ 836	$ 22,477	$ 94,352	$ 74,479
Repair / Replace Heating Elements after useful life of equipment	One Occurrence @ year 25		--	--	--	--	--	--	--	$ 98,794	$ 81,598
Replace overhead doors after useful life	Four Occurrences - @ years 10, 20, 30 and y		--	--	--	--	--	--	--	$ 69,513	$ 55,996
							TOTALS:	$ 5,144	$ 138,226	$ 830,880	$ 663,620

Discount Rate: 0.8%

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 3 - Heating, Ventilation, & Electrical Costs

Energy Cost Estimate for a 4050 SF Vehicle Storage Garage

January 2007 Energy Model Results for a 40,000 SF Vehicle Storage Garage

Energy Model Indicates total yearly electricity consumption @	157,000	kWh	3.925 kWh per SF - Cold Storage
Adjust for 3,335 SF Vehicle Storage Garage	15,896	kWh	
Annual Electricity Consumption:	15,896	kWh	
Electricity Cost:	0.2246	$ / kWh	(per US Energy Information Administration May 2025)
Annual Electricity Cost:	3,570	$ / Year	

Energy Cost Estimate for a 3,335 SF Vehicle Storage Garage:

Annual Fuel Cost @	$	-	per year
Annual Elec Cost @	$	3,570	per year
Total	$	3,570	1st Year

Over life of bldg with 3% / yr inflation:	$	388,468
Net Present Value:	$	317,894

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 4 - Increased Vehicle Maintenance Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment 1.5694

Average Employee Rate (loaded) $ 51.03
2025

Vehicle Type	Sheet	Maintenance Activity	FREQUENCY A: Estimated Occurrences per Year - Interior Storage (per veh.)	FREQUENCY B: Estimated Occurrences per Year - Exterior Storage (per veh.)	FREQUENCY C: Additional Occurrences per Year per Vehicle (B - A)	LABOR D: Average Maintenance Manhours per Occurrence	LABOR E: Number of Vehicles or Equipment	LABOR F: Total Manhours per Year (C x D x E)	LABOR G: Loaded Rate	LABOR H: Total Labor Cost per Year (F x G)	PARTS I: Parts Cost per Occurrence per Vehicle	PARTS J: Total Parts Cost per Year (C x E x I)	TOTAL K: Total Labor & Parts Cost per Year (1st Year) (H + J)	TOTAL L: Total Cost Over 20 Year Period	TOTAL M: Total Cost Over Life of Bldg (50 Years)	Net Present Value
Large Vehicles	1	Diagnose no start condition - remove, rebuild or replace starter motor	0.014	0.070	0.056	3	0	0	51.03	$ -	$ 250	$ -	$ -	$ -	$ -	$ -
	2	Diagnose no start condition (diesel) - gelled fuel, start vehicles with either	0	0.43	0.43	2.5	0	0	51.03	$ -	$ 15	$ -	$ -	$ -	$ -	$ -
	8	Repair windshield wiper system - replace wiper motors, repair or replace wiper linkage, replace wiper blades	0.06	0.39	0.33	2	0	0	51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	9	Repair hydraulic pumps, motors, gear boxes - change oil viscosity (summer/winter)	0	1	1	2.5	0	0	51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	10	Prepare vehicles for plow winter use - repair corroded electrical connections, clean rust from hydraulic pistons, replace frozen quick disconnects	2	3	1	2.5	0	0	51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	12	Repair brakes (air & hydraulic) on vehicles stored outdoors - brake shoes frozen to drums, calipers frozen to caliper frames	0	1	1	3.5	0	0	$ 51.03	$ -	$ 300	$ -	$ -	$ -	$ -	$ -
	13	Diagnose / repair frozen air systems	0	0.4	0	2	0	0	51.03	$ -	$ 20	$ -	$ -	$ -	$ -	$ -
	14	Repair or replace tires other than normal wear and tear - dry rot, rusted rims	0.05	0.16	0.11	1	0	0	$ 51.03	$ -	$ 150	$ -	$ -	$ -	$ -	$ -
	15	Repair rust / rot - coat rust with special primers/paint, weld patches/panels	0.1	0.26	0	6.5	0	0	$ 51.03	$ -	$ 525	$ -	$ -	$ -	$ -	$ -
	16	Diagnose water in fuel in vehicles stored outdoors	0	0.26	0.26	1	0	0	$ 51.03	$ -	$ 15	$ -	$ -	$ -	$ -	$ -
	17	Replace hydraulic lines - fittings rusted, hoses dry rotted	0.05	1	0.95	2	0	0	$ 51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	18	Check battery condition - recharge or replace	0.16	0.32	0.16	1	0	0	$ 51.03	$ -	$ 200	$ -	$ -	$ -	$ -	$ -
	19	Check alternator output	0.05	0.1	0.05	1.5	0	0	$ 51.03	$ -	$ 225	$ -	$ -	$ -	$ -	$ -

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 4 - Increased Vehicle Maintenance Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment 1.5694

Average Employee Rate (loaded) $ 51.03
2025

			FREQUENCY			LABOR					PARTS		TOTAL			
			A	B	C	D	E	F	G	H	I	J	K	L	M	
Vehicle Type	Sheet	Maintenance Activity	Estimated Occurrences per Year - Interior Storage (per veh.)	Estimated Occurrences per Year - Exterior Storage (per veh.)	Additional Occurrences per Year per Vehicle (B - A)	Average Maintenance Manhours per Occurrence	Number of Vehicles or Equipment	Total Manhours per Year (C x D x E)	Loaded Rate	Total Labor Cost per Year (F x G)	Parts Cost per Occurrence per Vehicle	Total Parts Cost per Year (C x E x I)	Total Labor & Parts Cost per Year (1st Year) (H + J)	Total Cost Over 20 Year Period	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Small Vehicles	8	Repair windshield wiper system - replace wiper motors, repair or replace wiper linkage, replace wiper blades	0.6	1.2	0.6	2	0	1.2	$ 51.03	$ 61	$ 100	$ 60				$ -
	9	Repair hydraulic pumps, motors, gear boxes - change oil viscosity (summer/winter)	0	1	1	2.5	0	0	51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	10	Prepare vehicles for plow winter use - repair corroded electrical connections, clean rust from hydraulic pistons, replace frozen quick disconnects	2	3	1	2.5	0	0	51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	11	Tune up vehicle stored outdoors - remove spark plugs frozen in engine, remove fuel filters frozen to fuel lines, replace ignition coils	0	0.21	0.21	10	0	0	$ 51.03	$ -	$ 500	$ -	$ -	$ -	$ -	$ -
	12	Repair brakes (air & hydraulic) on vehicles stored outdoors - brake shoes frozen to drums, calipers frozen to caliper frames	0	1	1	3.5	0	0	$ 51.03	$ -	$ 300	$ -	$ -	$ -	$ -	$ -
	14	Repair or replace tires other than normal wear and tear - dry rot, rusted rims	0.05	0.16	0.11	1	0	0	$ 51.03	$ -	$ 150	$ -	$ -	$ -	$ -	$ -
	15	Repair rust / rot - coat rust with special primers/paint, weld patches/panels	0.1	0.26	0.16	6.5	0	0	$ 51.03	$ -	$ 525	$ -	$ -	$ -	$ -	$ -
	16	Diagnose water in fuel in vehicles stored outdoors	0	0.26	0.26	1	0	0	$ 51.03	$ -	$ 15	$ -	$ -	$ -	$ -	$ -
	17	Replace hydraulic lines - fittings rusted, hoses dry rotted	0.05	1.00	0.95	2	0	0	$ 51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
	18	Check battery condition - recharge or replace	0.16	0.32	0.16	1	0	0	$ 51.03	$ -	$ 200	$ -	$ -	$ -	$ -	$ -
	19	Check alternator output	0.05	0.1	0.05	1.5	0	0	$ 51.03	$ -	$ 225	$ -	$ -	$ -	$ -	$ -
	20	Replace leaking brake / fuel lines	0	0.24	0.24	5	0	0	$ 51.03	$ -	$ 100	$ -	$ -	$ -	$ -	$ -

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 4 - Increased Vehicle Maintenance Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment 1.5694

Average Employee Rate (loaded) $ 51.03
2025

			FREQUENCY			LABOR					PARTS		TOTAL			
			A	B	C	D	E	F	G	H	I	J	K	L	M	
Vehicle Type	Sheet	Maintenance Activity	Estimated Occurrences per Year - Interior Storage (per veh.)	Estimated Occurrences per Year - Exterior Storage (per veh.)	Additional Occurrences per Year per Vehicle (B - A)	Average Maintenance Manhours per Occurrence	Number of Vehicles or Equipment	Total Manhours per Year (C x D x E)	Loaded Rate	Total Labor Cost per Year (F x G)	Parts Cost per Occurrence per Vehicle	Total Parts Cost per Year (C x E x I)	Total Labor & Parts Cost per Year (1st Year) (H + J)	Total Cost Over 20 Year Period	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Construction Equipment	3	Repair or replace trailer electrical connectors	0	1	1	1	9	9	$ 51.03	$ 459	$ 35	$ 315	$ 774	$ 20,805	$ 87,335	$ 68,940
	4	Prepare small equipment - engine seized due to water, engine oil contaminated with water, repair electronic ignition system	0	1	1	4	2	8	$ 51.03	$ 408	$ 275	$ 550	$ 958	$ 25,748	$ 108,086	$ 85,320
	--	Not Used			0			0	$ 51.03	$ -		$ -	$ -	$ -	$ -	$ -
	6	Prepare sweepers for spring use - repair/replace frozen water pumps, replace damaged water lines	0	1	1	8	0	0	$ 51.03	$ -	$ 200	$ -	$ -	$ -	$ -	$ -
	7	Prepare sanders stored outdoors for winter use. Free up frozen conveyors and replace hydraulic quick disconnects	0	2	2	8	0	0	$ 51.03	$ -	$ 300	$ -	$ -	$ -	$ -	$ -
	9	Repair hydraulic pumps, motors, gear boxes - change oil viscosity (summer/winter)	0	1	1	2.5	4	10	51.03	$ 510	$ 100	$ 400	$ 910	$ 24,460	$ 102,679	$ 81,052
	11	Tune up equipment stored outdoors - remove spark plugs frozen in engine, remove fuel filters frozen to fuel lines, replace ford ignition coils	0	0.21	0.21	10	2	4.2	$ 51.03	$ 214	$ 500	$ 210	$ 424	$ 11,402	$ 47,863	$ 37,781
	12	Repair brakes (air & hydraulic) on vehicles stored outdoors - brake shoes frozen to drums, calipers frozen to caliper frames	0	1	1	3.5	4	14	$ 51.03	$ 714	$ 300	$ 1,200	$ 1,914	$ 51,441	$ 215,941	$ 170,457
	13	Diagnose / repair frozen air systems	0	0.4	0	2	2	1.6	$ 51.03	$ 82	$ 20	$ 16	$ 98	$ 2,624	$ 11,014	$ 8,694
	14	Repair or replace tires other than normal wear and tear - dry rot, rusted rims	0.05	0.16	0	1	13	1.43	$ 51.03	$ 73	$ 150	$ 215	$ 287	$ 7,725	$ 32,426	$ 25,596
	15	Repair rust / rot - coat rust with special primers/paint, weld patches/panels	0.1	0.26	0.2	6.5	21	21.84	$ 51.03	$ 1,114	$ 525	$ 1,764	$ 2,878	$ 77,346	$ 324,685	$ 256,297
	16	Diagnose water in fuel in vehicles stored outdoors	0	0.26	0.26	1	2	0.52	$ 51.03	$ 27	$ 15	$ 8	$ 34	$ 923	$ 3,873	$ 3,057
	17	Replace hydraulic lines - fittings rusted, hoses dry rotted	0.05	1.00	0.95	2	2	3.8	$ 51.03	$ 194	$ 100	$ 190	$ 384	$ 10,316	$ 43,304	$ 34,183
	18	Check battery condition - recharge or replace	0.16	0.32	0.16	1	4	0.64	$ 51.03	$ 33	$ 200	$ 128	$ 161	$ 4,317	$ 18,122	$ 14,305
	19	Check alternator output	0.05	0.1	0.05	1.5	2	0.15	$ 51.03	$ 8	$ 225	$ 23	$ 30	$ 810	$ 3,401	$ 2,685
												TOTALS:	$ 8,975	$ 241,174	$ 1,012,405	$ 788,368

Town of Truro
Department of Public Works
Item 5 - Cost/Benefit Analysis

Baseline Vehicle/Equipment Replacement Costs

	Trailer/Forklift	Excavator/loader/Interstate	Plow	Dump Trailer
Recommended Average DPW Vehicle Life Expectancy (years)	10	15	20	
	3.0%			

Vehicle #	Description	Purchase Date	Purchase Price	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV
17	John Deer 130G Excavator	2006	$ 114,057	2025	$ 200,000	-	$ 200,000	2040	$ 311,593	15	$ 276,491	2055	$ 485,452	30	$ 382,235	2070	$ 756,319	45	$ 528,422				
18	John Deere Loader	2012	$ 170,238	2027	$ 265,225	-	$ 265,225	2042	$ 413,212	17	$ 360,864	2057	$ 479,026	32	$ 371,212	2072	$ 643,771	47	$ 442,676		$ -		
19	JLG 600S Lift	2020	$ 142,000	2030	$ 190,836	5	$ 183,383	2040	$ 256,468	15	$ 227,575	2050	$ 344,671	25	$ 282,418	2060	$ 463,209	35	$ 350,476	2070	$ 622,515	45	$ 434,936
20	Generator Box Trailer	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2035	$ 67,196	10	$ 62,049	2045	$ 90,306	20	$ 77,002	2055	$ 121,363	30	$ 95,559	2065	$ 163,102	40	$ 118,587
21	Generator Trailer	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2035	$ 67,196	10	$ 62,049	2045	$ 90,306	20	$ 77,002	2055	$ 121,363	30	$ 95,559	2065	$ 163,102	40	$ 118,587
22	Bandit Wood Chipper	2002	$ 24,997	2025	$ 49,334	-	$ 49,334	2035	$ 66,300	10	$ 61,222	2045	$ 89,102	20	$ 75,976	2055	$ 119,746	30	$ 94,285	2065	$ 160,929	40	$ 117,007
23	Timpte Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2035	$ 10,751	10	$ 9,928	2045	$ 14,449	20	$ 12,320	2055	$ 19,418	30	$ 15,289	2065	$ 26,096	40	$ 18,974
24	Cam Trailer	2007	$ 7,049	2025	$ 12,000	-	$ 12,000	2035	$ 16,127	10	$ 14,892	2045	$ 21,673	20	$ 18,481	2055	$ 29,127	30	$ 22,934	2065	$ 39,144	40	$ 28,461
25	Kaufman Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2035	$ 10,751	10	$ 9,928	2045	$ 14,449	20	$ 12,320	2055	$ 19,418	30	$ 15,289	2065	$ 26,096	40	$ 18,974
26	Interstate Trailer	2015	$ 35,717	2030	$ 55,645	5	$ 53,472	2045	$ 86,693	20	$ 73,922	2060	$ 135,065	35	$ 102,194	2075	$ 210,427	50	$ 141,278			-	$ -
27	Bence Trailer	1997	$ 50,000	2025	$ 114,396	-	$ 114,396	2035	$ 153,739	10	$ 141,964	2045	$ 206,613	20	$ 176,176	2055	$ 277,670	30	$ 218,632	2065	$ 373,165	40	$ 271,319
28	Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2035	$ 10,751	10	$ 9,928	2045	$ 14,449	20	$ 12,320	2055	$ 19,418	30	$ 15,289	2065	$ 26,096	40	$ 18,974
51	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
52	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
53	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
54	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
55	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
56	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
57	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
58	Standard Plow	2015	$ 2,976	2035	$ 5,376	10	$ 4,964	2055	$ 9,709	30	$ 7,645	2075	$ 17,536	50	$ 11,773	2085	$ -	60	$ -				
65	Forklift	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2035	$ 67,196	10	$ 62,049	2045	$ 90,306	20	$ 77,002	2055	$ 121,363	30	$ 95,559	2065	$ 163,102	40	$ 118,587
				Subtotals:	$ 1,104,442	NPV	$ 1,091,521	Subtotals:	$ 1,615,647	NPV	$ 1,434,020	Subtotals:	$ 2,216,152	NPV	$ 1,770,845	Subtotals:	$ 2,922,614	NPV	$ 2,131,249	Subtotals:	$ 1,763,348	NPV	$ 1,264,406
							$ 2,243,906																
Total Replacement Costs Based on 11 Year Vehicle Life Expectancy:					**$ 9,622,201**	(50 yr period)					$ 1,816,067				1469803				1202566				813910
					NPV: $ 7,692,042																		
					$ 7,546,251																		

NPV Notes:
1. Year 0 is assumed to be 2025
2. Net Present Value (NPV) discount rate is assumed to be 5%

Town of Truro
Department of Public Works
Item 5 - Cost/Benefit Analysis

2 Year Reduction in Vehicle & Equipment Life

	Trailer/Forklift	Excavator/loader/Interstate	Plow	Discount Rate
Recommended Average DPW Vehicle Life Expectancy (years)	10	15	20	0.8%
Reduced Average DPW Vehicle Life Expectancy (years)	8	13	18	
	3.0%			

2025

Vehicle #	Description	Purchase Date	Purchase Price	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV	Replacement Date	Estimated Replacement Cost	year	NPV
17	John Deer 130G Excavator	2006	$ 114,057	2025	$ 200,000	-	$ 200,000	2038	$ 293,707	13	$ 264,805	2051	$ 431,318	26	$ 350,610	2064	$ 633,405	39	$ 484,217			-	$ -				$ -				$ -
18	John Deere Loader	2012	$ 170,238	2025	$ 250,000	-	$ 250,000	2038	$ 367,133	13	$ 331,007	2051	$ 539,148	26	$ 438,262	2064	$ 791,757	39	$ 580,271			-	$ -				$ -				$ -
19	JLG 600S Lift	2020	$ 142,000	2028	$ 179,881	3	$ 175,632	2036	$ 227,868	11	$ 208,746	2044	$ 288,657	19	$ 248,103	2052	$ 365,662	27	$ 294,880	2060	$ 463,209	35	$ 350,476	2068	$ 586,780	43	$ 416,555				
20	Generator Box Trailer	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2033	$ 63,339	8	$ 59,427	2041	$ 80,235	16	$ 70,631	2049	$ 101,640	24	$ 83,948	2057	$ 128,754	32	$ 99,776	2065	$ 163,102	40	$ 118,587	2073	$ 206,613	48	$ 140,946
21	Generator Trailer	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2033	$ 63,339	8	$ 59,427	2041	$ 80,235	16	$ 70,631	2049	$ 101,640	24	$ 83,948	2057	$ 128,754	32	$ 99,776	2065	$ 163,102	40	$ 118,587	2073	$ 206,613	48	$ 140,946
22	Bandit Wood Chipper	2002	$ 24,997	2025	$ 49,334	-	$ 49,334	2033	$ 62,495	8	$ 58,635	2041	$ 79,166	16	$ 69,690	2049	$ 100,285	24	$ 82,829	2057	$ 127,038	32	$ 98,446	2065	$ 160,929	40	$ 117,007	2073	$ 203,859	48	$ 139,067
23	Timple Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2033	$ 10,134	8	$ 9,508	2041	$ 12,838	16	$ 11,301	2049	$ 16,262	24	$ 13,432	2057	$ 20,601	32	$ 15,964	2065	$ 26,096	40	$ 18,974	2073	$ 33,058	48	$ 22,551
24	Cam Trailer	2007	$ 7,049	2025	$ 12,000	-	$ 12,000	2033	$ 15,201	8	$ 14,262	2041	$ 19,256	16	$ 16,952	2049	$ 24,394	24	$ 20,148	2057	$ 30,901	32	$ 23,946	2065	$ 39,144	40	$ 28,461	2073	$ 49,587	48	$ 33,827
25	Kaufman Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2033	$ 10,134	8	$ 9,508	2041	$ 12,838	16	$ 11,301	2049	$ 16,262	24	$ 13,432	2057	$ 20,601	32	$ 15,964	2065	$ 26,096	40	$ 18,974	2073	$ 33,058	48	$ 22,551
26	Interstate Trailer	2015	$ 35,717	2028	$ 52,451	3	$ 51,212	2041	$ 77,026	16	$ 67,806	2054	$ 113,115	29	$ 89,777	2067	$ 166,113	42	$ 118,867				$ -				$ -				
27	Bence Trailer	1997	$ 50,000	2025	$ 114,396	-	$ 114,396	2033	$ 144,914	8	$ 135,985	2041	$ 183,573	16	$ 161,599	2049	$ 232,544	24	$ 192,067	2057	$ 294,580	32	$ 228,279	2065	$ 373,165	40	$ 271,319	2073	$ 472,715	48	$ 322,473
28	Trailer	2015	$ 5,953	2025	$ 8,000	-	$ 8,000	2033	$ 10,134	8	$ 9,508	2041	$ 12,838	16	$ 11,301	2049	$ 16,262	24	$ 13,432	2057	$ 20,601	32	$ 15,964	2065	$ 26,096	40	$ 18,974	2073	$ 33,058	48	$ 22,551
51	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -								
52	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
53	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
54	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
55	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
56	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -								
57	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
58	Standard Plow	2015	$ 2,976	2033	$ 5,067	8	$ 4,754	2051	$ 8,626	26	$ 7,012	2069	$ 14,686	44	$ 10,343				$ -				$ -				$ -				
65	Forklift	2015	$ 37,205	2025	$ 50,000	-	$ 50,000	2033	$ 63,339	8	$ 59,427	2041	$ 80,235	16	$ 70,631	2049	$ 101,640	24	$ 83,948	2057	$ 128,754	32	$ 99,776	2065	$ 163,102	40	$ 118,587	2073	$ 206,613	48	$ 140,946
				Subtotals:	$ 1,072,599	NPV	$ 1,064,608	Subtotals:	$ 1,477,773	NPV	$ 1,344,130	Subtotals:	$ 2,050,939	NPV	$ 1,703,531	Subtotals:	$ 2,667,867	NPV	$ 2,045,419	Subtotals:	$ 1,363,793	NPV	$ 1,048,367	Subtotals:	$ 1,727,613	NPV	$ 1,246,025	Subtotals:	$ 1,445,173	NPV	$ 985,858
							$ 2,305,585				$ 1,974,910				$ 1,630,962				$ 1,371,751				$ 1,153,736				$ 818,641				$ 818,641

NPV

Total Replacement Costs Based on 9 Year Vehicle LIfe Expectancy (50 yr Period): **$ 11,805,756**

Total Replacement Costs for 9 Year Vehicle Life Expectancy: **$ 9,437,937**

Town of Truro
Department of Public Works
Cost/Benefit Analysis - Item 6 - Site Development Costs for Exterior Vehicle Storage Area

Note: Cost to construct and maintain and exterior parking area over the life of the building

Description	Quantity	Unit	Unit Cost	TOTAL (No OH&P)	TOTAL (Incl. OH&P)
DIVISION 2 - SITE WORK					
GENERAL SITE WORK					
Earth Excavation Site	478	CY	$40.00	$19,125.93	$21,421.04
Formation of Subgrade	1434	SY	$5.00	$7,172.22	$8,032.89
Finish Grading	1434	SY	$1.54	$2,208.04	$2,473.00
Concrete Curb	374	LF	$61.60		
Processed Aggregate Base	478	CY	$60.00	$28,688.89	$32,131.56
Bituminous Concrete (5" pavement) Yard Area	12910	SF	$5.39	$69,584.79	$77,934.96
Underground Drainage System	1	LS	$55,000.00		
Site Lighting	1	LS	$4,000.00		
				Subtotal:	**$141,993**
				General Condit. (8.5%)	***$12,069***
				Subtotal	**$154,063**
				Contingency (15%)	**$23,109**
				Escalation (6%):	**$10,630**
				Total:	**$187,803**

Area/Dimensions to be adjusted for formulas above

Area	12910	SF	
Dim Garage	101		86
Dim Canopy			
	4060		

Assumptions: Concrete curb, drainage, and site lighting not included in order to not double count upfront site costs.

Town of Truro
Department of Public Works
Cost/Benefit Analysis - Item 7 - Exterior Storage Area Site Maintenance Costs

				NPV
Replace Pavement @ Year 20 and Year 40				
Yr 1		Reclaim Pvmnt:	$14,344	
Yr 1		New Pavement:	$77,935	
Yr 1		Contingency	$13,842	
		Cost @ Year 20 based on 3% escalation	$186,084	$159,941
		Cost @ Year 40 based on 3% escalation	$336,089	$246,317
		Total:	**$522,173**	$406,258
Yearly Striping				
		Labor per Year (hours):	32	
		Labor Rate (loaded):	$51.03	
Yr 1		Total Labor:	$1,633	
		Total cost over 50 years:	**$184,193**	$145,396
Snow Removal				
		Labor per event (hours):	8	
		Labor Rate (loaded):	$51.03	
		Number of Snow Events per Year:	6	
Yr 1		Total Labor	$2,449	
		Total cost over 50 years:	**$276,289**	$218,094
General Maintenance				
		Labor per week (hours):	1	
		Weeks:	52	
		Labor Rate (Loaded):	$51.03	
Yr 1		Total Labor	$2,654	
		Total cost over 50 years:	**$299,313**	$236,269
		TOTAL COST OF SITE MAINTENANCE:	**$1,281,969**	**$1,006,017**

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 8 - Cold Weather Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment
Average rate with out benefits

Average Workforce Rate (loaded) $ 51.03

	FREQUENCY			LABOR				FUEL CONSUMPTION				TOTAL		
	A	B	C	D	E	F	G	H	I	J	K	L	M	
Maintenance Activity	Workforce Personnel Effected by Warm-up / Preparation Requirement	Cold Weather Days	Average Warm-up / Preparation Time per Vehicle / Equipment (minutes)	Total Downtime Per Year (minutes)	Total Downtime Per Year (hours)	Loaded Labor Rate	Total Labor Cost per Year	Fuel Consumption Rate During Warm-up (gallons/hr)	Total Fuel Consumption During Warm-up (gallons)	Fuel Cost per Gallon	Total Fuel Consumption Cost During Warm-up per Year	Total Labor & Fuel Cost per Year (1st Year)	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Morning warm-up & vehicle preparation	2	85	10	1,700	28	$ 51.03	$ 1,446	$ 0.32	$ 9	$ 3.50	$ 32	$ 1,478	$ 166,667	$ 131,562
TOTALS:												$ 1,478	$ 166,667	$ 131,562

Cold Weather Days: Assume November 15 thru March 15th
17 weeks
5 days per week
85 days per year

Assumptions:
1. It is assumed that all workforce personnel will be delayed during vehicle preparation time.
2 It is assumed 1 personnel per excavator/loader

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 9 - Storm Event Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment
Average rate with out benefits

Vehicles with Plows: 8
Sanders: 0

Average Workforce Rate (loaded) $ 51.03

	FREQUENCY		LABOR					FUEL CONSUMPTION				TOTAL		
	A	B	C	D	E	F	G	H	I	J	K	L	M	
Maintenance Activity	Average Number of Plow Events	Average Number of Sand Events	Average Vehicle/Plow Preparation Time per Vehicle (minutes)	Average Sander Preparation Time per Sander (minutes)	Total Preparation Time (hours)	Loaded Labor Rate	Total Labor Cost per Year (F x E)	Fuel Consumption Rate During Warm-up (gallons/hr)	Total Fuel Consumption During Warm-up (gallons)	Fuel Cost per Gallon	Total Fuel Consumption Cost During Warm-up per Year (I x J)	Total Labor & Fuel Cost per Year (1st Year) (G + K)	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Vehicle Preparation & Plow Connection	6	7	30	30	24	51.03	$ 1,225	$ 0.32	$ 8	$ 3.50	$ 27	$ 1,252	$ 141,177	$ 111,441
										TOTALS:		$ 1,252	$ 141,177	$ 111,441

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 10 - Engine Block Heaters

Avg Annual Inflation Rate	3.0%
Number of Large Vehicles	3
Number of Small Vehicles	0
Number of Pieces of Construction Equipment	17

	FREQUENCY			LABOR				TOTAL		
	A	B	C	D	E	F	G	H	I	
Maintenance Activity	Vehicles & Equipment	Cold Weather Days	Average Block Heater Usage per Vehicle per Day (hours)	Total Block Heater Hours of Operation per Year (hours)	Engine Block Electrical Consumption (Kw)	Total Electrical Usage	Electrical Unit Cost ($/Kwh)	Total Electrical Cost per Year (1st Year) (F * G)	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Emergency Vehicles (continuous operation)	1	119	16	1,904	0.7	1,333	$ 0.18	$ 240	$ 27,060	
Non-Emergency Vehicles (4 hours operation)	1	119	4	476	0.7	333	$ 0.18	$ 60	$ 6,765	
								$ 300	$ 33,826	$ 26,701

Cold Weather Days: Assume November 15 thru March 15th
17 weeks
7 days per week
119 days per year

Assumptions:
1. It is assumed that all emergency response vehicles will be required to be plugged in overnight to ensure adequate equipment is available for the DPW use.
2. Non-emergency equipment will be on timers which will activate the block heaters 4 hours before operation.
3. It is assumed the loader is an emergency vehicle and the excavator is a non-emergency vehicle

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 11 - Loading & Unloading Costs

Avg Annual Inflation Rate	3.0%
Benefits Adjustment	
Number of Large Vehicles	3
Number of Small Vehicles	0
Number of Pieces of Construction Equipment	17
Average Workforce Rate (loaded)	$ 51.03

	FREQUENCY			LABOR				TOTAL		
	A	B	C	D	E	F	G	H	I	
Maintenance Activity	Number of Vehicles Impacted by Operations	Number of Employees Impacted by Operations	Average Loading & Unloading Time per Vehicle per Day (minutes)	Total Downtime Per Year (minutes)	Total Downtime Per Year (hours)	Loaded Labor Rate	Total Labor Cost per Year (F x E)	Total Labor Cost per Year (1st Year) (G)	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Vehicle Loading & Unloading	6	1	33	8,250	138	$ 51.03	$ 7,017	$ 7,017	$ 791,453	$ 624,750
Work Days	250							$ 7,017	$ 791,453	$ 624,750

Assumptions:
1. It is assumed that there is 1 employee loading and unloading the inside vehicles

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 12 - Vehicle Staging Non-Productive Labor Costs

Avg Annual Inflation Rate	3.0%
Benefits Adjustment	
Number of Large Vehicles	3
Number of Small Vehicles	0
Number of Pieces of Construction Equipment	17
Average Mechanics Rate (loaded)	$ 51.03

	FREQUENCY						PARTS		TOTAL			
	A	B	C	D	E	F	G	H	I	J	K	L
Description	Employees Impacted	Non-Productive Labor per Employee (hours)	Cold Weather Days or Storm Events	Total Manhours per Year (A x B x C)	Loaded Rate	Total Labor Cost per Year (D x E)	Average Parts Cost per Year per Equipment	Total Parts Cost per Year	Total Labor & Parts Cost per Year (1st Year) (F + H)	Total Cost Over 20 Year Period	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Unload Salt/Sand after Storm Event	0	0.3	13	0	51.03	$ -		$ -	$ -	$ -	$ -	$ -
							TOTALS:		$ -	$ -	$ -	$ -

Cold Weather Days: Assume November 15 thru March 15th
17 weeks
5 days per week
85 days per year

1. No Salt/Sanders stored outside in this scenario

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 13 - Employee Safety Costs

Avg Annual Inflation Rate	3.0%
Benefits Adjustment	
Number of Large Vehicles	3
Number of Small Vehicles	0
Number of Pieces of Construction Equipment	17
Average Workforce Rate (loaded)	$ 51.03
2025	

	FREQUENCY			TOTAL		
	A	B	C	D	E	
Description	Average Hours of Lost Labor per Year	Loaded Labor Rate	Total Labor Cost per Year (A x B)	Total Labor Cost per Year (1st Year) (C)	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Loss of labor due to injury	10.0	$ 51.03	$ 510	$ 510	$ 57,560	$ 45,436
				$ 510	$ 57,560	$ 45,436

Assumptions:
1. It is assumed that the Town will incur an average of 10 hours per year of lost labor due to injuries resulting from exposure of employees to fall hazards or other hazards associated with exterior storage of equipment & materials

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 14 - Environmental Impact Costs

Avg Annual Inflation Rate 3.0%
Benefits Adjustment
Average rate no benefits

Average Workforce Rate (loaded) $ 51.03

Description	A Consultant Hours	B Consultant Fee	C Consultant Expenses / Contractors	D Total Consultant Costs	E Regulatory Fees	F Clean-up Costs	TOTAL K 1st Year Occurrence Total Costs	
Immediate Response Actions (containment)	2	$ 180.00	$ 1,000	$ 1,360	$ -	$ -	$ 1,360	
DEP Notification & Remediation Submittals	6	$ 180.00	$ 1,000	$ 2,080	$ 6,000	$ -	$ 8,080	
Limited Soil and Surface Disposal	4	$ 180.00	$ 1,000	$ 1,720	$ -	$ 30,000.00	$ 31,720	
Close-out (response action outcome)	10	$ 180.00	$ 1,000	$ 2,800	$ -	$ -	$ 2,800	
						Year 1 Cost	$ 43,960	
								NPV
						Year 10	$ 57,358	$ 53,389
						Year 20	$ 77,084	$ 66,254
						Year 30	$ 103,595	$ 82,221
						Year 40	$ 139,223	$ 102,035
						Year 50	$ 187,103	$ 126,624
						Total Cost:	**$ 564,362**	**$ 430,523**

Assumptions:
1. It is assumed that there will be one reportable hazardous materials release associated with storing equipment outdoors every +/- 10 years (year 10, 20, 30, 40, and 50) associated with leaks/spills from vehicles & equipment stored outdoors

Town of Truro
Department of Public Works
Cost / Benefit Analysis - Item 15 -Preventative Maintenance Delay Costs

Avg Annual Inflation Rate	3.0%
Benefits Adjustment	
Number of Large Vehicles	2
Number of Small Vehicles	0
Number of Pieces of Construction Equipment	17
Average Mechanics Overtime Rate (loaded)	$ 63.66

		LABOR					PARTS		TOTAL			
		A	B	C	D	E	F	G	H	I	J	
Vehicle Type	Maintenance Activity	Average Maintenance Manhours per Vehicle	Number of Vehicles or Equipment	Total Manhours per Year	Loaded Rate	Total Labor Cost per Year	Parts Cost per Occurrence per Vehicle	Total Parts Cost per Year	Total Labor & Parts Cost per Year (1st Year) (H + J)	Total Cost Over 20 Year Period	Total Cost Over Life of Bldg (50 Years)	Net Present Value
Large Vehicles	Additional Maintenance Hours	2	2	4	$ 63.66	$ 255	$ 200	$ 400	$ 655	$ 17,590	$ 73,839	$ 58,286
Small Vehicles	Additional Maintenance Hours	2	0	0	$ 63.66	$ -	$ 100	$ -	$ -	$ -	$ -	$ -
Construction Equipment	Additional Maintenance Hours	2	2	4	$ 63.66	$ 255	$ 200	$ 400	$ 655	$ 17,590	$ 73,839	$ 58,286
								TOTALS:	$ 1,309	$ 35,180	$ 147,678	$ 116,573

Note:
1. These costs are based on additional maintenance tasks due to delayed preventative maintenance resulting from the additional services required by Item 4.
2. Due to current workload, it is assumed that these services will be performed on overtime.
3. Assumed loader/excavator for large vehicles, and lifts for construction EQ.

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TRURO DPW FACILITY PROJECT
Estimated Total Project Costs Summary
(UPDATED 9/17/2025)

The estimated Total Project Costs as summarized in the table on Page 2 refer to the following design scenarios:

- Scenario 1: (Current Base Bid)
  - *11,145* square foot main Building plus 2,500 square feet of Mezzanine; totalling13,645 SF
    - Wash Bay with protective finishes, but without vehicle wash equipment
    - Increase in main building square footage due to the need for a Fire Pump Room
  - New Salt Shed
  - New Generator
  - New Septic Treatment & Disposal System for the DPW and Town Hall
  - PWS Drinking Well a Water Main for the DPW and Town Hall
  - Fire Protection Pump Room & Cistern
  - Stormwater Drainage

- Scenario 2: (Ad Hoc Base Bid Recommendation)
  - *18,955* square foot main Building plus 2,500 square feet of Mezzanine; totaling 21,455 SF
    - Wash Bay with protective finishes, but without vehicle wash equipment
  - New Salt Shed
  - New Generator
  - New Septic System Treatment & Disposal for the DPW and Town Hall
  - PWS Drinking Well a Water Main for the DPW and Town Hall
  - Fire Protection Pump Room & Cistern
  - Stormwater Drainage

- Scenario 3: (Recommended Base & New Bit Alt 1 Recommendation)
  - Recommended Base as described in Scenario 2
  - 5,000 square foot Storage Garage Extension (new Bid Alt #1 recommendation)
    - Building size totaling 26,455 SF

- Scenario 4: (Recommended Base & New Bit Alt 1 + 2 Recommendations)
  - Recommended Base as described in Scenario 2
  - 5,000 square foot Storage Garage Extension (new Bid Alt #1 recommendation)
    - Building size totaling 26,455 SF
  - 4,050 SF standalone Cold Storage Building (new Bid Alt #2 recommendation)

See figure on Page 3 for a diagram of the Ad Hoc Building Committee's new recommendations for the Base DPW Design and Bid Alternates.

Estimated Total Project Costs Summary per Scenario

	SCENARIOS			
	Scenario 1 Current Base	**Scenario 2** Ad Hoc Recommended Base	**Scenario 3** Recommended Base & Bid Alt 1	**Scenario 4** Recommended Base & Bid Alt 1 + 2
Construction Costs	± $ 20,050,000	± $ 22,200,000	± $ 23,560,000	± $ 25,060,000
Geothermal Well Field Cost	± $ 1,200,000	± $ 1,200,000	± $ 1,200,000	± $ 1,200,000
Soft Costs & Contingencies	± $ 5,270,075	± $ 5,525,900	± $ 5,580,300	± $ 5,640,300
Construction Contingency (5% of Construction Value)	± $ 1,062,500	± $ 1,170,000	± $ 1,238,000	± $ 1,313,000
Phased Construction Costs [A]	N/A	± $ 1,391,700 [A]	± $ 1,391,700 [A]	± $ 1,391,700 [A]
Temporary On-Site Facilities	± $ 120,000	N/A	N/A	N/A
Opinion of Probable Total Project Costs	**± $ 27,702,575**	**± $ 31,487,600**	**± $ 32,970,000**	**± $ 34,605,000**
2024 Appropriation	($ 2,800,000)	($ 2,800,000)	($ 2,800,000)	($ 2,800,000)
Total Remaining Appropriation	**± $ 24,902,575**	**± $ 28,687,600**	**± $ 30,170,000**	**± $ 31,805,000**
Fleet Cost-Benefit Analysis LCCA [B]	± $ 12,100,000 [B]	± $ 8,123,400 [B]	± $ 7,209,000 [B]	± $ 3,386,700 [B]
Total Long-Term Project & Operational Costs (50 yrs) [C]	**± $ 37,002,575 [C]**	**± $ 36,811,000 [C]**	**± $ 37,379,000 [C]**	**± $ 35,191,700 [C]**
Mass Save Heat Pump Adder Construction Incentive ($2/sf ±) Post-Occupancy Incentive ($1.5/sf)	($ 135,000) ($ 22,290 ±) ($ 16,717)	($ 135,000) ($ 37,820 ±) ($ 28,365)	($ 135,000) ($ 47,820 ±) ($ 35,865)	($ 135,000) ($ 47,820 ±) ($ 35,865)
30% IRA Federal Tax Credit	($ 869,400 ±)	($ 1,159,000 ±)	($ 1,228,500 ±)	($ 1,228,500 ±)
Total Incentives & Credits	**($ 1,043,407 ±)**	**($ 1,360,685 ±)**	**($ 1,447,185 ±)**	**($ 1,447,185 ±)**

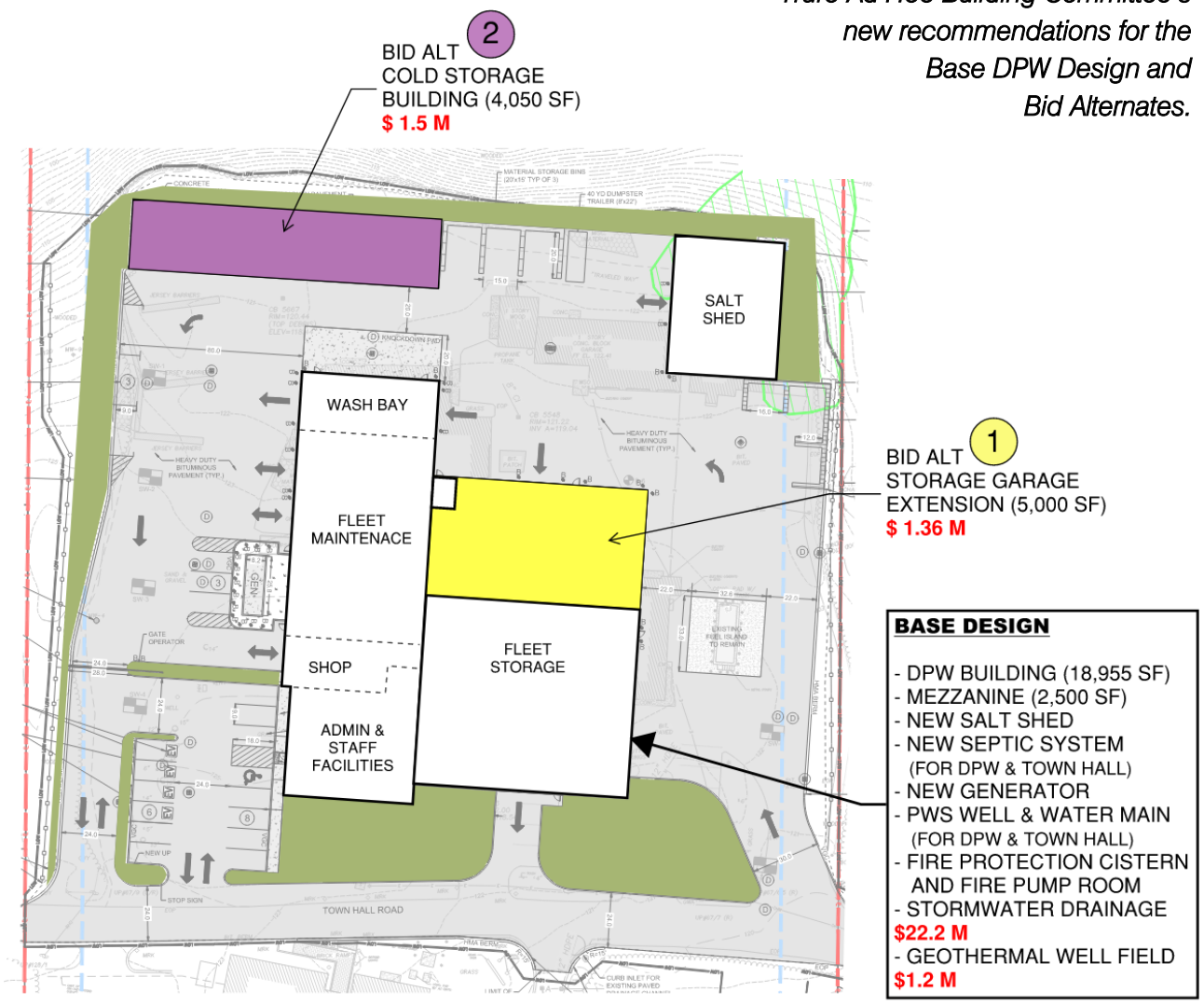
[A] Phased Construction accounts for (9) additional months of General Conditions at $125,000/months and (4) months escalation to midpoint of construction (1%).

- alternatively, temporary off-site facilities are estimated at $380,000 and would be added to the Soft Costs in lieu of the $1.39 M

[B] LCCA includes additional fleet maintenance costs due to outdoor storage, and the building maintenance costs and HVAC/Electrical costs of the fleet storage areas; all of which over a 50 year period.

[C] Total Remaining Appropriation plus Fleet Cost-Benefit Analysis LCCA.

Truro Ad Hoc Building Committee's new recommendations for the Base DPW Design and Bid Alternates.



<u>Notes:</u>

- Estimated Geothermal cost (in addition to HVAC costs) = $ 1,200,000
    - Based off of a 23,600 SF facility with a 30 ton heating load (SD estimate)
        - It is assumed that the entire geothermal well field will be designed and installed in all scenarios regardless of associated heating load to support future expansion
    - Increases to building area and HVAC system is not expected to be a 1:1 cost increase
        - Estimated Geothermal & HVAC costs per Scenario (what the IRA Tax Credit is based off of):
            - Scenario 1 = $ 2,898,000
            - Scenario 2 = $ 3,865,000
            - Scenario 3 = $ 4,095,000
            - Scenario 4 = same as Scenario 3
                - Cold storage Bid Alt 2 includes negligible ventilation costs

Price Driven Option (Current Base & Cold Storage Bid Alternate)

- 11,145 square foot main Building plus 2,500 square feet of Mezzanine; totalling13,645 SF
  - Wash Bay with protective finishes, but without vehicle wash equipment
- 4,050 square foot Cold Storage Building Bid Alternate
- New Salt Shed
- New Generator
- New Septic Treatment & Disposal System for the DPW and Town Hall
- PWS Drinking Well a Water Main for the DPW and Town Hall
- Fire Protection Pump Room & Cistern
- Stormwater Drainage

	Current Base & Cold Storage Building [A]
Construction Costs	± $ 21,550,000
Geothermal Well Field Cost	± $ 1,200,000
Soft Costs & Contingencies	± $ 5,502,575
Construction Contingency (5% of Construction Value)	± $ 1,137,500
Temporary On-Site Facilities	± $ 120,000
Opinion of Probable Total Project Costs	**± $ 29,510,075**
2024 Appropriation	($ 2,800,000)
Total Remaining Appropriation	**± $ 26,710,075**
Fleet Cost-Benefit Analysis LCCA [B]	± $ 8,981,500 [B]
Total Long-Term Project & Operational Costs (50 yrs) [C]	**± $ 35,691,575 [C]**
Mass Save Heat Pump Adder Construction Incentive ($2/sf ±) Post-Occupancy Incentive ($1.5/sf)	($ 135,000) ($ 22,290 ±) ($ 16,717)
30% IRA Federal Tax Credit	($ 869,400 ±)
Total Incentives & Credits	**($ 1,043,407 ±)**

[B] LCCA includes additional fleet maintenance costs due to outdoor storage, and the building maintenance costs and HVAC/Electrical costs of the fleet storage areas; all of which over a 50 year period.

[C] Total Remaining Appropriation plus Fleet Cost-Benefit Analysis LCCA.