City of Rockaway Beach

Tillamook County, Oregon

Five Year Streets Capital Improvements Plan

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March 2024

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Project No. 2015-009.29

Prepared By:

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Introduction

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Introduction

Section 1

1.1 INTRODUCTION

The City of Rockaway Beach (City) is located approximately 75 miles west of Portland and 15 miles north of Tillamook on Highway 101 in Tillamook County, Oregon (Figure 1). Roads around town are City and County owned and maintained streets. There were nearly 1,500 permanent residents surveyed during the 2020 census. However, the City also serves many transient and seasonal residents making the total population served significantly larger.

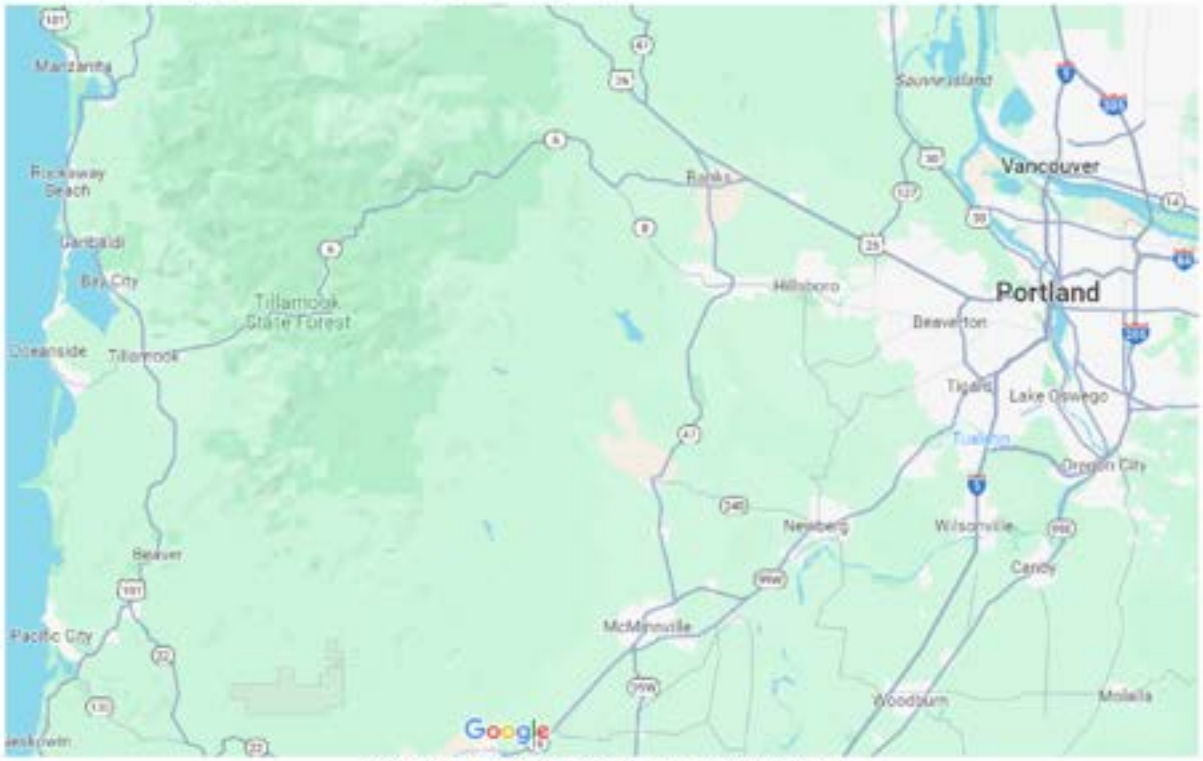

Figure 1 - Rockaway Beach Location Map

In August of 2023, the City Council authorized HBH Consulting Engineers, Inc. (HBH) to begin work on a Street Capital Improvements Plan (CIP). The CIP would serve as a five-year planning tool to identify infrastructure deficiencies needing prioritization. The study is intended to look at City-owned streets to evaluate the quality of the road surfacing itself. It is not intended to evaluate roads for pedestrian, bicycle, or drainage facilities.

A CIP is a planning document that lays out infrastructure deficiencies, funding sources- and provides priorities, construction timelines, and planning-level cost estimates. This document will evaluate projects for improvements beginning in the 2024-2025 fiscal year and running through the 2029-2030 fiscal year. There are more projects included for consideration in this document than the City has funds to feasibly complete. It was intended to include additional projects in the event significant grant funds become available, the City will have a list of additional projects for consideration.

1.2 SCOPE OF STUDY

1.2.1 Planning Period

A typical transportation study would evaluate the overall health of the city's transportation infrastructure over 20 years. However, this is intended to be a truncated short-term plan to cover the next five fiscal years extending through fiscal year 2029-2030.

1.2.2 Planning Area

The primary planning area for this Study is limited to city-owned and maintained streets. Generally, these streets fall within the City of Rockaway Beach city limits. However, certain roads are still maintained by Tillamook County or within the Port of Tillamook Bay (POTB) right of way and are not included in the evaluation.

1.3 AUTHORIZATION

The City of Rockaway Beach contracted with HBH Consulting Engineers, Inc. to prepare this Street CIP in August 2023 by authorizing a Scope of Engineering Services on which the scope of this Plan is based.

1.4 ACKNOWLEDGMENTS

This CIP was produced in cooperation with the City of Rockaway Beach. In particular, the following persons should be acknowledged for the important roles they played in the preparation, review, and development of this Plan:

Luke Shepard ..... City of Rockaway Beach City Manager
Dan Emerson..... City of Rockaway Beach Public Works Superintendent
Melissa Thompson ..... City of Rockaway Beach City Recorder

In addition to these key personnel, we wish to thank the City of Rockaway Beach City Council and members of the public that issued written comments on the project. We thank you for providing support and input on this project.

SECTION 2

Street Inventory

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HBH met with City staff in August 2023 to begin to compile a preliminary street database. This list was presented to the City Council at the regularly scheduled October 2023 Council Meeting where input was received from both Council and the public. A database of streets for consideration was finalized after receiving online public comments as well as comments from the City Council Meetings. This inventory is shown in Table 2-1.

The street database includes both collectors and local streets within the city's jurisdiction. County roads or roads within the Port of Tillamook Bay (POTB) right of way were not considered in this report. The one exception to this was streets that were submitted by public comment. In this instance, the street was included in the report to acknowledge the submittal; but was not evaluated further.

2.2.2 Basis of Evaluation

To prioritize capital improvements over the next five years, it is necessary to evaluate the streets included in the database. Working with City staff and officials, a set of criteria was developed to serve as the basis of evaluation and included the following items:

- Street Condition
- Project Cost & Timeline
- Funding Sources/Leveraging Opportunities
- Considerations for Future Development

Street Condition

A street condition assessment form was created and used to evaluate the quality of existing wearing surfaces. The condition assessment was primarily geared towards existing asphalt roads more than gravel roads. A site evaluation was completed to inspect the street for signs of distress including alligator cracking, bleeding, block cracking, longitudinal and transverse cracking, edge cracking, joint reflection cracking/patch failure, polished aggregate, potholes, raveling, and rutting. Given the use of the roads and aggregates commonly used by paving companies in the area, the roads evaluated did not show significant signs of rutting or polished aggregate.

For gravel roads, surfaces were inspected for signs of distress and deformation, primarily potholes and wasboarding. Additionally, gravel roads were assessed for existing drainage to determine the feasibility of converting the gravel road to an asphalt wearing surface. Roads that require significant drainage improvements may not receive as favorable of an evaluation.

Street condition served as the primary consideration when prioritizing projects over the next five years. Copies of the Street Assessment form for each asphalt road are included at the end of this study.

Project Cost & Timeline

Since this project is looking at a condensed timeline of five years, the projects were evaluated on a pass/fail basis. Roads that could have their useful life dramatically extended through use of a maintenance slurry or crack seal project were given additional consideration in priority rankings. Streets that have already passed the point of maintenance were considered a rehabilitation project. All the rehab projects included in this report are deemed high priority. However, having already passed their window of opportunity for maintenance, it is unlikely that completing a rehab project in year 1 as opposed to year 5 would have a tangible impact on the cost of the project. With that said, if maintenance could be completed to postpone the need for major repairs, this cost savings was a consideration in the final prioritization of the projects.

Table 2-1 - Street Inventory Database

Street	Cross Street 1	Cross Street 2	Length (ft)
Beach Dr	NE Lake Blvd	Section Line St	3,600
Cedar Cr Cir	N Marine	Timberlake Dr	500
Cedar Cr Cir	N Marine	Timberlake Dr	500
N 3rd Ave	N Dolphin St	N Grayling St	750
N 5th Ave	Highway 101	East to End	275
N 5th Ave	N Juniper St	East to End	125
N Beacon St	N 3rd Ave	North to End	400
N Dolphin St	N 3rd Ave	North to End	350
N Easy St	N 3rd Ave	North to End	300
N Grayling St	N 3rd Ave	South to End	400
N Miller St	NW 20th Ave	NE 1st St	6,800
N Pacific Ln	NW 13th Ave	NW 17th Ave	825
N Pacific St	N 3rd Ave	NW 11th Ave	4,300
NE 20th Ave	Highway 101	East to End	125
NE Lake Blvd	NE 12th Ave	NE 15th Ave	650
NW 14th Ave	N Miller St	N Pacific Ln	125
NW 15th St	N Miller St	West to End	200
NW 16th St	N Miller St	West to End	275
NW 17th St	N Miller St	West to End	225
NW 18th Ave	N Miller St	West to End	275
NW 20th Ave	N Miller St	West to End	275
NW 21st Ave	Scenic Coast RR	West to End	275
NW 22nd Ave	NW 23rd Ave	South to End	400
NW 6th Ave	N Coral St	Cedar Cr Cir	1,900
S 2nd St	E Washington St	Stark St	500
S 3rd St	S Juniper St	East to End	950
S 5th Ave	S Easy St	S Dolphin St	200
S Anchor St	S 2nd Ave	SE 5th Ave	2,000
S Anchor St	S 6th Ave	South to End	350
S Anchor St	S 6th Ave	South to End	500
S Beacon St	E Washington St	Stark St	500
S Beacon St	S 6th Ave	South to End	375
S Beacon St	E Washington St	North to End	325
S Coral St	S 6th Ave	North to End	400
S Coral St	S 6th Ave	South to End	175
S Coral St	E Washington St	North to End	350
S Crest Terrace	S Terrace Dr	End	350
S Dolphin St	S 5th Ave	South to End	850
Street	**Cross Street 1**	**Cross Street 2**	**Length (ft)**
S Dolphin St	**E Washington St**	North to End	350
S Dolphin St	E Washington St	South to End	450
S Easy St	S 6th Ave	South to End	400
S Easy St	E Washington St	North to End	350
S Easy St	E Washington St	South to End	450
S Falcon St	S 6th Ave	South to End	375
S Falcon St	S 2nd Ave	North to End	150
S Falcon St	S 2nd Ave	South to End	175
S Falcon St	E Washington St	North to End	350
S Front St	S 6th Ave	North to End	350
S Harbor St	SE 2nd Ave	S Sheldon Ln	300
S Harbor St	S Nehalem Ave	S 2nd Ave	650
S Harbor St	S 2nd Ave	South to End	650
S Home Ct	S Pacific View Dr	End	80
S Island St	S 2nd Ave	S Sheldon Ln	300
S Juniper St	E Washington St	North to End	300
S Juniper St	E Washington St	South to End	450
S Keel St	S Nehalem Ave	S 2nd Ave	650
S Marine St	S 2nd Ave	South to End	650
S Miller St	S 1st Ave	SE 3rd Ave	4,000
S Nehalem Ave	S Juniper St	At Intersection	
S Neptune St	SE 2nd Ave	North to End	150
S Neptune St	S 2nd Ave	North to End	200
S Pacific St	S 2nd Ave	S 3rd Ave	450
S Pacific St	S 3rd Ave	S 4th Ave	650
S Pacific St	S 6th Ave	S 7th Ave	450
S Pacific View Dr	Hillside Dr	End	450
S Palisade St	S Nehalem Ave	S 2nd Ave	650
S Palisades St	S 2nd Ave	South to End	225
S Quadrant St	S 2nd Ave	S 4th Ave	950
S Quadrant St	S Nehalem Ave	S 2nd Ave	650
S Rock Creek Rd	S 2nd Ave	South to End	1,350
SE Kesterson Ct	S Pacific View Dr	End	250
Timberlake Dr	NW 6th Ave	Cedar Cr Cir	525
Timberlake Dr	NW 6th Ave	Cedar Cr Cir	525

Funding Sources/Leveraging Opportunities

A vital responsibility of city staff and officials is allocating city funds. Communities across Oregon are constantly struggling to generate sufficient funds to complete the maintenance and rehabilitation of community roads. Occasionally state and federal funds become available to assist small communities in maintaining their street systems. If grant funds are available to the City for certain projects, that serves as free money to the community. Many grants or other funds will have a period of performance attached to the grant terms. If the money is not spent within a certain amount of time, it is returned to the original grantor. Projects that have current grant funds allocated to them will receive a boost in priority to ensure the project is completed within the required period of performance of the grant. Prioritizing projects that are eligible for outside funding ensures the responsible use of taxpayer funds.

Considerations for Future Development

Future use and planning of city streets are essential when considering short-term planning. Paving new roads or rehabilitating existing roads is a considerable investment for a community. At some point, utility work will necessitate cutting and patching asphalt surfaces. However, the City should aim to prolong the new wearing surface for as long as possible. The City should try to leave roads untouched for a minimum of five years after wearing surface improvements are made. This means areas with known planned development, developable lots, or undersized utilities that may be upgraded in the next 5-10 years were generally not considered as part of this study.

Water mains in residential areas vary in size depending on, among other things, demand, and pressure zone. Water mains in Rockaway are typically intended to be a minimum of six or eight inches in diameter. Areas with small diameter water mains or water and sewer mains that contain old steel, polyethylene, or asbestos cement pipes were not considered to upgrade wearing surfaces from gravel to asphalt. This was for two reasons. First, small-diameter water mains with developable land adjacent are at risk of needing to be upsized. Secondly, the material of certain buried utilities may require more frequent repair. Old polyethylene pipes can be very brittle, steel faces considerable corrosion issues, and asbestos cement pipes are fragile. These streets should have utilities upgraded to meet current design standards before upgrading the road wearing surface.

Figures 2-1 and 2-2 show a map of the roads considered as part of the street database inventory.

2.2.3 Project Classification

Four separate project classifications were created depending on the condition assessment of the streets in the database. The project classifications include major rehabilitation & overlay projects, maintenance rehabilitation, new asphalt roads, and high capital cost new asphalt roads.

Major Rehabilitation & Overlays

These are streets that need considerable improvements to either the road subbase, base, or wearing surface. Projects that appear to have adequate wearing surfaces may need a full width overlay to be completed. Some streets will have surface deformation that implies minor issues with the road base material allowing them to also be repaired with a full-width overlay. However, other roads will show signs of severe surface deformation, suggesting significant issues with the road base or subbase. In these instances, it may be necessary to complete full depth restoration to rebuild the road base.

Roads classified as a Major Rehabilitation & Overlay are considered past the window for maintenance to extend their useful life. They are all generally considered high-priority projects;

however, their condition is not anticipated to see continual deterioration to the point where postponement to the end of the planning period could cause an increase in repair costs.

Maintenance Rehabilitation

Maintenance rehabilitation includes projects such as slurry or crack sealing as the recommended repair. These are generally considered roads in good overall condition but show signs of early surface deformation that left unaddressed, could lead to rapid deterioration of the street-wearing surface. Typically, small maintenance projects can sufficiently repair the road surface and dramatically increase its useful life.

New Asphalt Roads

This category includes roads that would be converted from existing gravel roads to new asphalt roads. Most of the roads in this category are dead-end residential roads. To be considered for this category, the road must not serve properties with developable or subdividable lots and should have buried utilities that have already been upgraded to meet current City design standards.

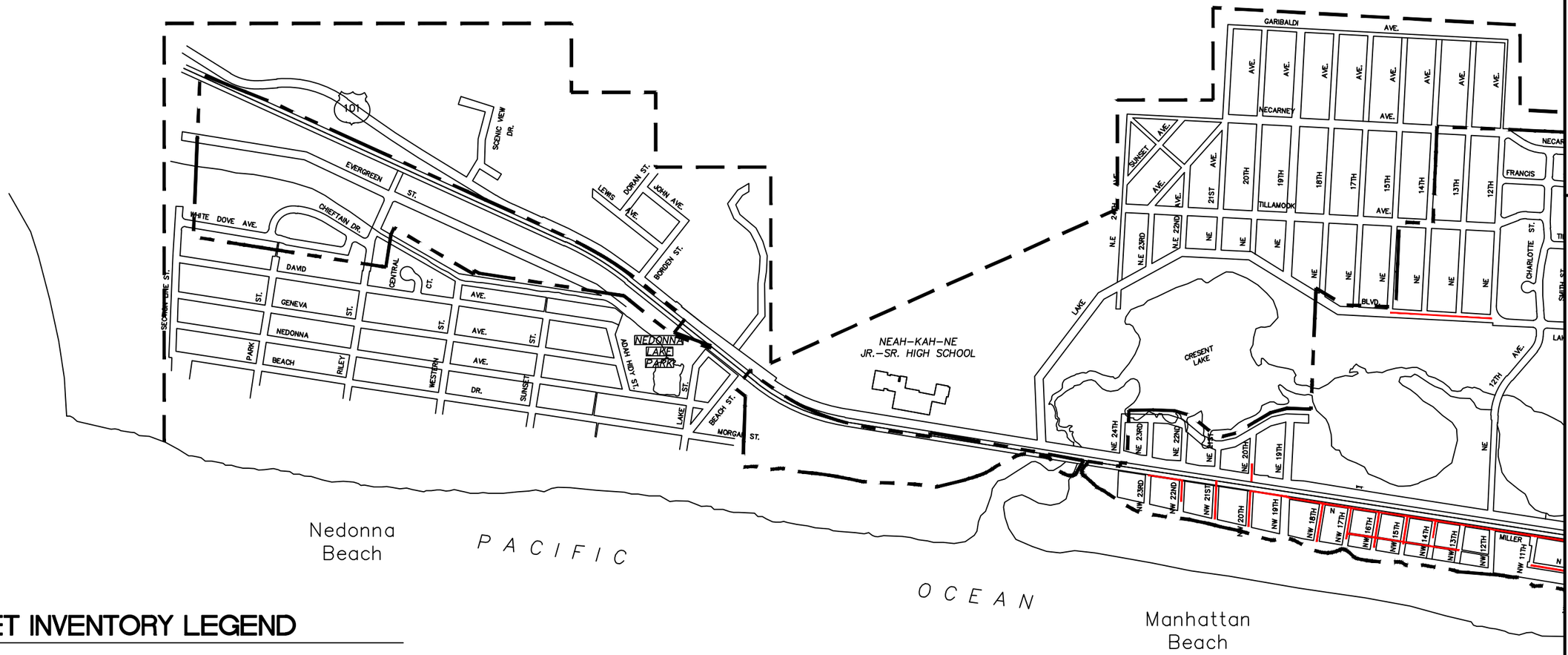
High Capital Cost New Asphalt Roads

Roads included in this category were the remainder of the gravel roads in the street database that do not meet the conditions of the New Asphalt Roads. These are roads that will require upgrades to the water or sewer system within the next five to ten years, serve developable lots, or do not have sufficient stormwater infrastructure to capture the runoff of the new impervious surface. These are projects that should be kept for planning purposes in the event outside funding becomes available to complete utility upgrades in these residential areas, or in the event additional City funds are allocated from the water and sewer funds to provide the necessary upgrades.

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.



STREET INVENTORY LEGEND

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- STREETS INVENTORIED
- ROAD PROJECTS

STREET INVENTORY DATABASE

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

NORTH ROCKAWAY INVENTORY

DRAWN BY: MCD

DATE: FEB. 2024

FIG. 2-1

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.

STREET INVENTORY LEGEND

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- STREETS INVENTORIED
- ROAD PROJECTS

STREET INVENTORY DATABASE

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

SOUTH ROCKAWAY INVENTORY

DRAWN BY: MCD

DATE: FEB. 2024

FIG. 2-2

SECTION 3

Condition Assessment

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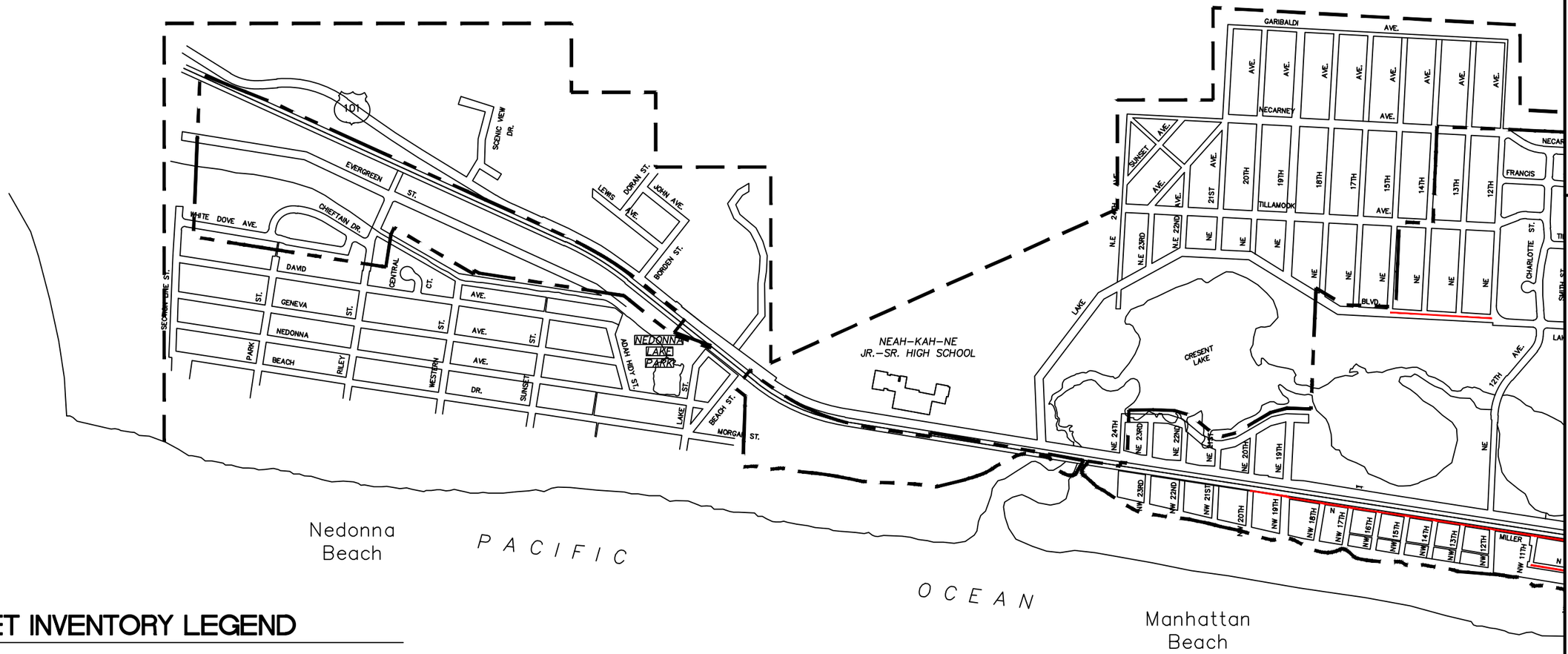
Table 3-1: High Capital Cost New Asphalt Roads

Street	Cross Street 1	Cross Street 2	Length (ft)
5th Ave	S Easy St	**S Dolphin St**	**200**
S Harbor St	S Nehalem Ave	**S 2nd Ave**	**650**
S Island St	S 2nd Ave	**S Sheldon Ln**	**300**
S Harbor St	S 2nd Ave	**South to End**	**650**
NW 15th St	N Miller St	**West to End**	**200**
NW 16th St	N Miller St	**West to End**	**275**
NW 17th St	N Miller St	**West to End**	**225**
N Pacific Ln	NW 13th Ave	**NW 17th Ave**	**825**
S 3rd St	S Juniper St	**East to End**	**950**
S Marine St	S 2nd Ave	**South to End**	**650**
N Beacon St	N 3rd Ave	**North to End**	**400**
S Easy St	S 6th Ave	**South to End**	**400**
S Neptune St	S 2nd Ave	**North to End**	**200**
N Dolphin St	N 3rd Ave	**North to End**	**350**
N Easy St	N 3rd Ave	**North to End**	**300**
S Anchor St	S 6th Ave	**South to End**	**500**
S Beacon St	S 6th Ave	**South to End**	**375**
S Coral St	S 6th Ave	**North to End**	**400**
S Coral St	S 6th Ave	**South to End**	**175**
S Dolphin St	S 5th Ave	**South to End**	**850**
S Falcon St	S 6th Ave	**South to End**	**375**
S Falcon St	S 2nd Ave	**North to End**	**150**
S Falcon St	S 2nd Ave	**South to End**	**175**
S Rock Creek Rd	S 2nd Ave	**South to End**	**1350**
NW 14th Ave	N Miller St	**N Pacific Ln**	**125**
NW 18th Ave	N Miller St	**West to End**	**275**
NW 22nd Ave	NW 23rd Ave	**South to End**	**400**
NW 20th Ave	N Miller St	**West to End**	**275**
NW 21st Ave	Scenic Coast RR	**West to End**	**275**
NE 20th Ave	Highway 101	**East to End**	**125**
S Beacon St	E Washington St	**North to End**	**325**
S Coral St	E Washington St	**North to End**	**350**
S Dolphin St	E Washington St	**North to End**	**350**
S Dolphin St	E Washington St	**South to End**	**450**
S Easy St	E Washington St	**North to End**	**350**
S Easy St	E Washington St	**South to End**	**450**
S Falcon St	E Washington St	**North to End**	**350**
S Juniper St	E Washington St	**North to End**	**300**
S Juniper St	E Washington St	**South to End**	**450**
S Keel St	S Nehalem Ave	**S 2nd Ave**	**650**
S Palisades St	S 2nd Ave	**South to End**	**225**
N Grayling St	N 3rd Ave	**South to End**	**400**
N 5th Ave	Highway 101	**East to End**	**275**
N 5th Ave	N Juniper St	**East to End**	**125**
S Harbor St	SE 2nd Ave	**S Sheldon Ln**	**300**
S Neptune St	SE 2nd Ave	**North to End**	**150**

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.



STREET INVENTORY LEGEND

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- STREETS INVENTORIED
- ROAD PROJECTS

STREET EVALUATION MAP

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

NORTH ROCKAWAY EVALUATION

DRAWN BY: MCD

DATE: FEB. 2024

FIG. 3-1

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.

STREET INVENTORY LEGEND

URBAN GROWTH BOUNDARY
CITY LIMITS
STREETS INVENTORIED
ROAD PROJECTS

STREET EVALUATION MAP

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

SOUTH ROCKAWAY EVALUATION

DRAWN BY: MCD
DATE: FEB. 2024

FIG. 3-2

North 3rd Avenue from N Dolphin St to N Grayling St

Beginning at North Grayling Street and heading west to North Dolphin Street, North 3rd Avenue is in varying condition. This section of road measures approximately 750 feet and passes in front of the Neah-Kah-Nie School District offices. The section of asphalt between North Grayling Street and the eastern side of the Neah-Kah-Nie School District driveway is in very good condition. There are a few transverse cracks near grade changes that were likely caused by subsurface cracks reflecting to the surface. These cracks allow moisture to infiltrate leading to future potholes and a rapid expansion of surface deformation.

From the east side of the school district's driveway heading west to Dolphin Street, the asphalt surface is in very poor condition. There are significant potholes at the joint with the new asphalt surface. Significant alligator and block cracking is occurring on all sections of the road. Additionally, there is a longitudinal crack down the centerline of the road at the crown. To form the crown on the road, the pavers would have paved the northern and southern half of the road separately. The centerline longitudinal crack is most likely the cause of a failed joint between the two portions of the road. There is also significant and widespread rutting over the entire section. This can be caused by a poor bond between the asphalt binder and the aggregate. Given the overall age of the road, the raveling is most likely caused by oxidation of the asphalt binder.

North Miller Street from NE 1st St to NW 20th Ave

Between NE 1st and NW 20th, Miller Street varies in condition. From NE 1st Ave to NE 12th Ave, Miller Street is in good condition and may have been paved within the past few years while Miller north of NW 20th was paved during the summer of 2023. Between NE 12th Avenue and NW 20th Avenue, there are a few cracks, and the wearing surface is showing signs of early distress. The road is in fair condition overall. Early raveling is apparent on all sections of asphalt. A few potholes exist just south of the intersection of North Miller Street and NW 20th Avenue that could expand if not addressed.

Given use, early maintenance could extend the useful life of the road though it does not face the same urgency of repairs as some of the other streets in this study.

North Pacific Street from N 3rd Ave to NW 9th Ave

At the south end of North Pacific Street near the newer development, the asphalt surface is in fair condition. Some block cracking is beginning to show at the south end and could potentially be early fatigue or reflective cracking from the asphalt beneath the new wearing surface.

The remainder of the road is in poor condition. The road may have been constructed with a crown, but settlement over time has caused the road to be flat in many areas and even has what is functioning as an inverted crown (the centerline of the road is lower than the edges of asphalt). Settlement also occurs throughout the wearing surface. The drainage on this section of road is poor and water is ponding throughout. The accumulation of water on the surface will rapidly accelerate surface deformation. There are a significant number of potholes on this road that likely started as sags and depressions where water did not drain. Between 3rd and 4th there is an unlocated sewer main that needs to be potholed and upgraded. The water main should be upgraded and is already considered a capital improvement project with dedicated water funds.

This project was selected by the Oregon Department of Transportation (ODOT) for inclusion in the Small City Allotment program. The City was awarded a $250,000 grant from ODOT to overlay the

road in this area. The period of performance ends at the end of 2025, so this project should be considered a priority to maximize funding.

Northeast Lake Boulevard from NE 12th Ave to NE 15th St

Lake Boulevard between NE 12th Avenue and NE 15th Street is in poor condition. Significant potholes and alligator cracks have formed throughout which implies the existing road base is in poor condition. The drainage infrastructure appears adequate. Settlement over time has effectively removed much of the road crown. Sags have formed in some areas and have progressed to full potholes in others. The entire road surface appears to have experienced significant surface oxidation and raveling. The road is in the poorest condition near the intersection with North 13th Avenue.

South Anchor Street from S 2nd Ave to SE 5th Ave

Between S 2nd and S 3rd Avenue, Anchor Street is in good condition. There is a prominent centerline crack beginning at the intersection of S 2nd Avenue and continues nearly to the intersection of S 3rd Avenue. This crack is likely the failure of the joint between the placement of each travel lane.

From S 3rd Avenue to S 4th Avenue, Anchor Street is in poor condition. There is a significant amount of alligator cracks present on the northern half of the road in addition to a longitudinal centerline crack running the entire length of the block. Significant raveling has begun due to the age of the asphalt.

From S 4th Avenue to SE 5th Avenue, the asphalt condition is considerably improved from one block north. There are a couple of patch failure cracks at the north end of the block. The road surface shows signs of early oxidation but is currently in stable condition.

South Anchor Street from S 6th Ave South to End

This portion of South Anchor Street is a gravel road beginning at South 6th Avenue and dead ending approximately 500 feet south. The gravel road serves eight homes, six to the east and two to the west.

The gravel is in good condition and appears suitable for asphalt. There is no formal drainage infrastructure on this section of road. However, there are drainage ditches on the south side of 6th Avenue that could be utilized to send runoff from new ditches.

South Terrace Drive through South Crest Terrace

South Terrace Drive and South Crest Terrace are in poor condition with significant alligator cracking, potholes, and raveling. The road has been overlayed before with the current wearing surface having failed and delamination is exposing the asphalt layer below. There are numerous patches on the asphalt that are unraveling and/or have experienced patch crack failures. Towards the north end of South Crest Terrace, the asphalt has deteriorated to the point where the current surface is primarily composed of gravel aggregate. The base material is unlikely to be in adequate condition and should be considered for repairs.

South Front Street from S 6th Avenue North to End

Located immediately east of Saltair Creek, this portion of South Front Street is a gravel road extending approximately 350 ft to the north of 6th. The road serves one residence to the east of the road and three units to the west of Saltair Creek. The gravel surface appears to be in good condition and drainage can be implemented to address runoff from a new impervious surface.

South Home Court from S Pacific View Drive to the End

Home Court is a short and wide gravel road branching off South Pacific View Drive that serves five residences. The current road surface is gravel. However, inspection of the road shows deteriorated asphalt approximately one to three inches beneath the road surface. The gravel on the road is primarily composed of ¾" rock with limited fines or crushed material.

South Nehalem Ave and South Juniper Street Intersection

A prior year's paving project on South Nehalem Avenue ended just before the intersection with South Juniper Street due to a limitation of funding. The condition of South Nehalem Avenue in the intersection of South Juniper Street continues to be poor with a considerable amount of alligator cracks, potholes, patch failures, and raveling. The condition continues east on South Nehalem Avenue for approximately 300 feet past the intersection. From here, the fatigue cracking and other surface deformation subsides while significant raveling from oxidation continues further to the east.

South Pacific Street from S 2nd Avenue to S 4th Avenue

Located west of Highway 101, South Pacific Street serves both residential and commercial areas. The section of road between S 2nd and S 3rd Avenue is in poor condition, experiencing longitudinal cracking as well as patch failures. The western two-thirds of the street is experiencing significant oxidation and raveling.

From S 3rd to S 4th Ave, S Pacific Street's condition is considerably worse. Patch failures are present in the entire block and drainage is very poor. The western half of the road ponds considerable amounts of water during rain events, though water does not drain well on either side of the road. Much of the wearing surface has been worn off revealing significant amounts of aggregate. Drainage is the worst on the southern third of the block where large rain events cause water to pool across the entire width of the road, leading to a more rapid deterioration of the asphalt.

South Pacific Street from S 6th Ave to S 7th Ave

This is a roughly 450 ft stretch of gravel road. The surface of the street is packed gravel free of potholes or significant depressions. There does not appear to be much developable land off of this street. The road does appear to have some drainage concerns as the street is relatively flat. Water appears to pool mostly between driveways and on the gravel road, allowing limited infiltration through the packed gravel. The City may want to consider a drainage system before converting the gravel road to asphalt.

South Pacific View Drive from Hillside Drive South to the End

S Pacific View Drive is a residential street that provides access to six homes off a steep hill. The road is in poor condition overall with very poor raveling of the wearing surface, particularly at the northern end of the road. Block cracking is fair to poor for much of the northern half. Asphalt drainage channels were formed on the western side of the road at a driveway to keep drainage flowing downhill and away from the home (it is unclear if these cold patches were placed by the City or by the homeowners). However, the joint between this asphalt channel and the road surface has pulled apart. An asphalt cold patch was placed on the eastern edge of the road across from the prior mentioned driveway. It is unclear if this was to fill potholes or if it was leftover asphalt from the channel pour.

The bottom half of the road has been converted to gravel surfacing which was placed on very degraded asphalt. It is unclear the condition of the asphalt underneath; however, it is assumed it

would need to be rebuilt. Asphalt should not be poured on top of the loose gravel surfacing on the bottom half of the road, or it will be prone to slippage.

South Palisade Street and S Quadrant Street between S Nehalem Ave and S 2nd Ave

South Palisade and S Quadrant Streets are located one block apart. Both streets are currently gravel and measure approximately 650 ft each. The gravel appears to be in good condition; though, a considerable amount of loose aggregate is on top, which implies it may have been resurfaced recently. This makes it difficult to identify potential subsurface concerns. Drainage has been established on both sides of the roads. Both roads would be ideal candidates for upgrading to asphalt.

The portion of Nehalem Avenue between S Quadrant and S Palisade should also be considered for rehabilitation when the gravel roads are upgraded. This stretch of street measures approximately 200 ft and has significant surface deformation. The manhole at the intersection of S Quadrant and S Nehalem has raised above the rest of the wearing surface and could damage a vehicle traveling at significant speeds. This section of road is experiencing significant fatigue cracking and raveling presumably due to its age.

South Quadrant Street from S 2nd Ave to S 4th Ave

South Quadrant is a residential street east of the downtown corridor of Rockaway Beach. The road contains steep slopes greater than 15%. The wearing surface appears to be recently repaired as there are no visible signs of cracking, rutting, or other forms of surface deformation. Some preliminary surface raveling is present though the degree of raveling does not seem like a significant concern. A maintenance project in the coming years should be considered to extend the life of the pavement.

Southeast Kesterson Ct from S Pacific View Drive West to the End

SE Kesterson Ct is a short residential street on the hill on the eastern portion of Rockaway. Similar to Pacific View Drive, the asphalt deterioration gets progressively worse down the hill. There is a minor joint failure at the connection to S Pacific View Drive. Minor surface raveling is present all over, presumably due to age. Downhill the raveling gets worse, and delamination reveals older lifts of asphalt. Further downhill, longitudinal cracking and more advanced fatigue cracks are present. In one area of delamination, concrete surfacing is showing through. Towards the bottom of the hill, the asphalt transitions to gravel surfacing. The gravel appears to vary in thickness. Digging through the road, the gravel section was found to be one to three inches thick. Large-diameter rocks rise through the gravel at the base of the hill, suggesting the original asphalt may not have much base material remaining.

3.1.2 Summary of Evaluation

The streets evaluated in this planning document overall saw very few issues with rutting, edge cracking, or polished aggregate, meaning the aggregate used for paving has held up well over time. This is likely due to low use, both in terms of volume and weight classification, relative to the age of the asphalt. There was very little rutting noted, likely due to relatively low use. Table 3-2 summarizes the condition of the streets analyzed.

The largest area of concern in streets evaluated was raveling followed by fatigue (alligator) cracking, longitudinal cracking, and transverse cracking. Many of these issues are caused by the age of the streets and harsh environments. Asphalt binders oxidize and harden over time. The increased hardness prevents the binders from relaxing and responding to stresses applied to the road surface. When the binder gets too stiff, it begins to break into smaller particles and erode. As this happens, the wearing surface shows primarily aggregate with limited emulsified asphalt. Raveling can be worse in coastal environments where damp salt air blows in from the Pacific Ocean, coating all surfaces in town. As

the moisture in the air evaporates, salt crystals begin to form on the road. This has a similar impact to constantly putting small doses of deicing salt on wearing surfaces. The harsh environment places a significant burden on municipalities and public works staff to maintain infrastructure.

3.2 PROPOSED CAPITAL IMPROVEMENTS

With the condition assessment completed, projects were categorized based on repairs needed. The projects were divided into three categories as described in Section 2. These projects are shown in Figures 3-3 and 3-4. Capital improvements were then broken into three separate groups: Priority 1, Priority 2, and Priority 3 (new asphalt roads). New roads were not considered as part of the Priority 1 or 2 groups as there is no existing asphalt at risk of further deterioration. The roads should be upgraded as they fit in with nearby projects and as the budget allows.

3.2.1 Public Input

The City received considerable public input for this project both at Council Meetings and through the online comment submission form. Some of the projects submitted by the public were included for evaluation. For the projects not included in the report, it is important to provide context.

Beach Drive from NE Lake Blvd to Section Line St

The street submitted is in poor shape and would be a good project for rehabilitation. Unfortunately, Beach Drive is a county road and as such is outside of the City of Rockaway Beach's jurisdiction for maintenance.

South Miller Street from S 1st Ave to SE 3rd Ave

South Miller Street falls within the Port of Tillamook Bay (POTB) Right of Way and is thus outside of the City's jurisdiction. This project would require agreements between the City and POTB. While that may be a possibility in the future, this study was only intended to analyze city streets within the City's Right-of-Way that could be improved as funds became available.

South Beacon and South 2nd St (Anchor St) from E Washington St to Stark St

Both streets were initially evaluated for inclusion in the report. Both streets had surface deformation in poor or very poor condition. S Anchor St is very narrow in areas and doesn't facilitate two-way passing traffic. Both streets would be set up well for rehabilitation projects, but both are county roads and as such are not eligible for inclusion in this report.

Northwest 6th Avenue between N Coral St and Timberlake Drive

This is an existing gravel road that seems to have adequate stormwater drainage utilizing roadside ditches. There is considerable opportunity for development along this road and the road is not within the City's jurisdiction, which is why it was not included in this report.

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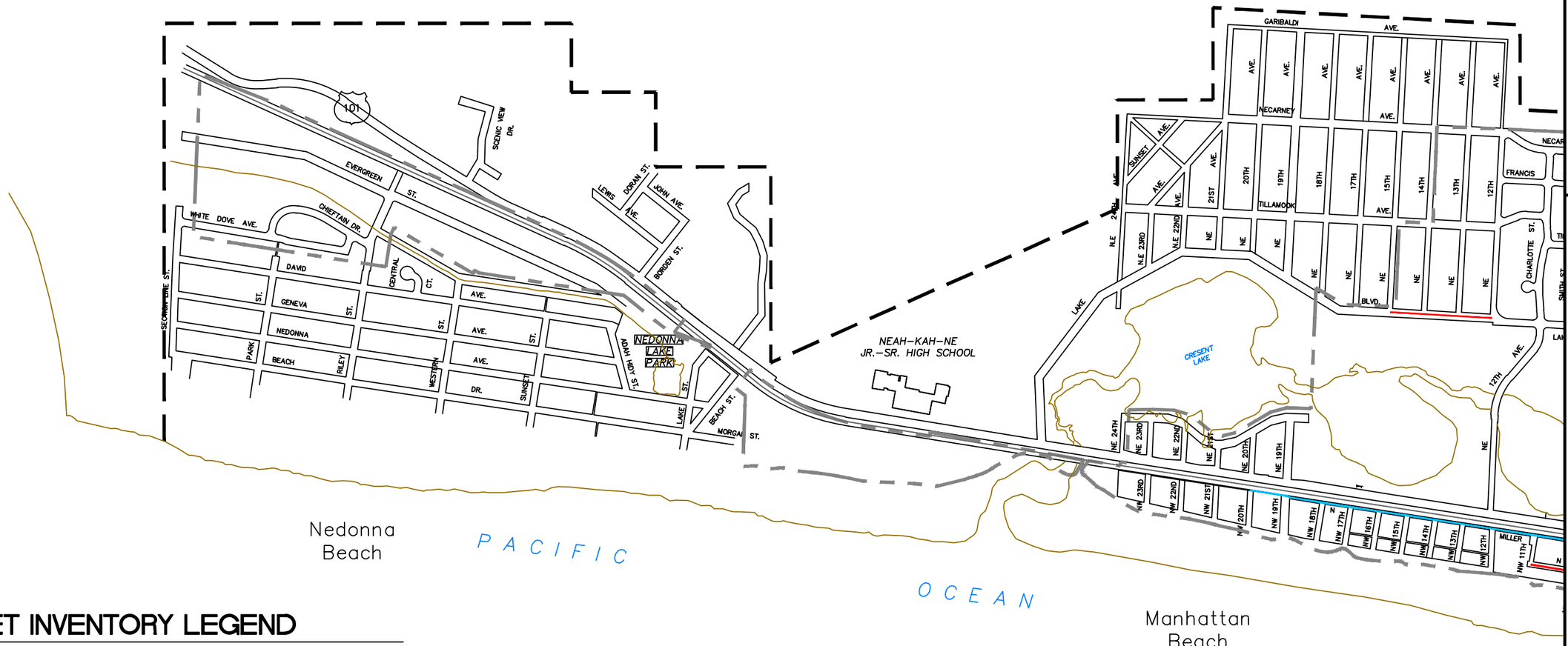
Table 3-2 - Street Condition Summary

Street	Begin Street	Ending Street	Alligator Cracking	Block Cracking	Longitudinal & Transverse Cracking	Edge Cracking	Joint Reflection Cracking	Polished Aggregate	Potholes	Raveling	Rutting
N Pacific St	N 3rd Ave	**NW 11th Ave**	Poor	Very Poor	Very Poor	Good	Poor	Good	Poor	Poor	Good
S Pacific St	S 2nd Ave	**S 3rd Ave**	Fair	Poor	Very Poor	Good	Very Poor	Good	Fair	Poor	Good
S Pacific St	S 3rd Ave	**S 4th Ave**	Poor	Poor	Poor	Good	Very Poor	Good	Very Poor	Very Poor	Good
NE Lake Blvd	NE 12th Ave	**NE 15th Ave**	Very Poor	Very Poor	Very Poor	Poor	Fair	Good	Very Poor	Fair	Good
S Pacific View Dr	Hillside Dr	**End**	Very Poor	Fair	Poor	Fair	Poor	Good	Good	Very Poor	Good
SE Kesterson Ct	S Pacific View Dr	**End**	Poor	Fair	Poor	Poor	Fair	Good	Good	Very Poor	Good
S Crest Terrace	S Terrace Dr	**End**	Very Poor	Very Poor	Very Poor	Poor	Very Poor	Good	Very Poor	Very Poor	Good
S Home Ct	S Pacific View Dr	**End**	**Not Inspected Due to Gravel Surfacing**								
Intersection	S Nehalem Ave	**S Juniper St**	Very Poor	Very Poor	Poor	Poor	Very Poor	Good	Very Poor	Very Poor	Poor
N 3rd Ave	N Dolphin St	**N Grayling St**	Very Poor	Poor	Fair	Fair	Fair	Good	Poor	Very Poor	Fair
S Quadrant St	S 2nd Ave	**S 4th Ave**	Good	Good	Good	Good	Good	Good	Good	Fair	Good
S Anchor St	S 2nd Ave	**SE 5th Ave**	Poor	Poor	Poor	Good	Poor	Good	Good	Very Poor	Good
N Miller St	NW 20th Ave	**NE 1st St**	Fair	Good	Fair	Good	Good	Good	Fair	Fair	Good
S Dolphin St	S 2nd Ave	**S 3rd Ave**	Poor	Poor	Poor	Fair	Fair	Good	Poor	Poor	Good

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.



STREET INVENTORY LEGEND

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- STREETS INVENTORIED
- MAJOR ROAD PROJECTS
- MAINTENANCE PROJECTS
- NEW PAVING PROJECTS
- HIGH CAPITAL PROJECTS

STREET CLASSIFICATIONS

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

NORTH ROCKAWAY CLASSIFICATION

DRAWN BY: MCD

DATE: FEB. 2024

FIG. 3-3

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 800 ft.

STREET INVENTORY LEGEND

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- STREETS INVENTORIED
- MAJOR ROAD PROJECTS
- MAINTENANCE PROJECTS
- NEW PAVING PROJECTS
- HIGH CAPITAL PROJECTS

STREET CLASSIFICATIONS

SCALE: 1" = 800'

H B H Consulting Engineers

City of Rockaway Beach
STREET CAPITAL IMPROVEMENTS

SOUTH ROCKAWAY CLASSIFICATION

DRAWN BY: MCD

DATE: FEB. 2024

FIG. 3-4

3.2.2 Priority 1 Capital Improvement Projects

Projects included in this section are due to the condition of the asphalt, or the necessary timeline for completion required by available funding. The following projects should be considered high priority:

P1-1. North Pacific Street between North 3rd Avenue and NW 9th Avenue
P1-2. South Pacific Street between South 3rd Avenue and South 4th Avenue
P1-3. South Crest Terrace and South Terrace Drive northwest to the end
P1-4. South Nehalem Avenue beginning at South Juniper Street and east approximately 300 feet
P1-5. Northeast Lake Boulevard between NE 12th Ave and NE 15th St
P1-6. South Pacific View Drive between Hillside Drive and south to the end
P1-7. South Anchor Street from South 2nd Avenue to Southeast 5th Avenue

In reviewing the streets above, South Pacific Street, South Crest Terrace, and South Terrace Drive are in the worst condition followed closely by North Pacific Street, Northeast Lake Boulevard, and South Pacific View Drive. North Pacific Street was elevated to P1-1 due to currently allotted ODOT grant funds that must be spent by the end of 2025. The combination of poor road quality and outside funding made it the highest priority repair in an effort to maximize City funds. Complete cost estimates for each project are included in the addendums.

P1-1 North Pacific Street between North 3rd Avenue and NW 9th Avenue

Work on North Pacific Street should begin with potholing the sewer between S 4th and S 3rd Avenues. The City knows there is an old sewer main that provides services to several homes in the area that has not been located. The sewer should be potholed and extended south. A new manhole should be installed near the intersection with S 3rd Avenue and all homes on the old unlocated sewer main should be transferred over to the new main extension. The existing water main consists of 4- and 2-inch pipes with leak concerns needing to be upgraded to 8-inch PVC. Due to the number of potholes and sag points, a 1" leveling course should be applied to the existing asphalt surface. A tack coat and overlay geotextile should be applied to the top of the leveling course before a final 2" wearing surface is placed for the finished surfacing. The new asphalt surface should have a crown reestablished to allow the new road surface to shed water off the wearing surface. The placement of the overlay geotextile will prevent cracks in the existing asphalt from reflecting up to the new wearing surface. The total anticipated construction cost for this project is approximately $1.6 million.

P1-2 South Pacific Street between South 3rd Avenue and South 4th Avenue

This portion of South Pacific Street has significant drainage concerns as water pools on the road surface. The water can create an unsafe condition for motorists and is detrimental to the asphalt. Several large potholes have formed. Block cracking and raveling are present the entire length of the road. There are many patches to repair surface deformation and buried utilities. The water main on this road should be upgraded to prevent further utility patches. Catch basins should be installed and connected to the storm system in S 4th Avenue. The southern portion of the road should be regraded to better facilitate drainage into the new storm system. Finally, the City should complete a leveling course and overlay furnished with an overlay geotextile. The anticipated construction cost for this project is approximately $310,000 assuming the storm system work is completed by City staff.

P1-3 South Crest Terrace and South Terrace Drive

South Crest Terrace is in very poor condition. The road is experiencing dramatic fatigue failure, patch failure, raveling, and delamination from lower layers of asphalt. The existing asphalt is not anticipated to provide much structural support. The extent of the cracking and failures of the

surfacing would pose too high of a risk to make an overlay feasible. The road is steep to the point where an overlay geotextile is not recommended as it opens up the risk of slippage failures in the new overlay. Without an overlay geotextile, existing cracks would rapidly transfer to the new overlay surface. This road is recommended for a full-depth restoration. Figure 3-5 below shows the extent of the asphalt damage on S Terrace Drive.

Figure 3-5 South Terrace Drive

Full-depth restoration of this road would include grinding and removal of the existing asphalt wearing surface, excavating the existing base and subbase, and placing eight inches of new ¾"-0" crushed rock aggregate base. The new wearing surface for the road would be constructed of four inches of level 2 hot mix asphalt concrete pavement mixed per ODOT standards. The anticipated construction cost to complete this work is $205,000.

P1-4 South Nehalem Avenue beginning at South Juniper Street and east approx. 300 feet

Significant degradation of the asphalt has left widespread alligator cracking and raveling on the asphalt surface. There are numerous potholes at the intersection which suggest the existing road base has degraded over time and requires rebuilding. It is suggested the City complete a full-depth restoration project beginning at the west end of the Nehalem and Juniper intersection and continuing approximately 300 ft to the east. The asphalt at this point is showing signs of surface raveling, but other surface deformation is minimal and could be overlayed in the future. Anticipated construction costs to complete this work are approximately $125,000.

P1-5 Northeast Lake Boulevard between NE 12th Ave and NE 15th St

The section of Lake Boulevard between 12th and 15th is in poor condition, particularly between the intersections with 13th Avenue and 14th Street. This section of the road is showing significant fatigue cracking and contains numerous potholes. This suggests the base section between these roads has deteriorated over time. It is recommended to remove the top twelve inches of road surfacing, base rock, and native subbase between NE 13th Avenue and NE 14th Street. A new road geotextile should be placed on a compacted subbase and twelve inches of ¾"-0" aggregate base should be placed and compacted. At this point, a three-inch overlay can be placed over the entire section of the road between NE 12th Avenue and NE 15th Street. In areas where a full-depth restoration is not being completed, a tack coat and overlay geotextile should be placed to cracks from the existing asphalt from reflecting to the new wearing surface. The anticipated construction cost of this project is $175,000.

P1-6 South Pacific View Drive between Hillside Drive and south to the end

The condition of South Pacific View Drive is in a gray area. The asphalt could likely be overlayed with minimal issues if the road geometry was flat. However, grades reach roughly 15% making the placement of an overlay geotextile not recommended. Placing an overlay on top of the existing asphalt surface without an overlay geotextile would pose a significant risk of reflective cracking on the new surface. For this reason, it is recommended the City complete a full-depth restoration of the road. This would include grinding and removing the top twelve inches of surface material. The City would then place and compact eight inches of ¾"-0" aggregate road base followed by four inches of level asphalt. Construction costs to complete this work are approximately $150,000.

P1-7 South Anchor Street from South 2nd Avenue to Southeast 5th Avenue

South Anchor Street is in considerably better condition than many of the streets included as priority one projects. From S 2nd to S 3rd and again from S 4th to S 5th, the road is in generally good condition. There are a few longitudinal cracks and a couple of early signs of fatigue cracking. The surface asphalt is showing early signs of oxidation and raveling. Due to the early signs of distress, a maintenance program is recommended to extend the useful life of these sections of road.

Between S 3rd and S 4th Avenues, the asphalt appears to be older as more raveling is present and there is considerable fatigue cracking present. A tack coat, overlay geotextile, and three-inch overlay are recommended to be placed to rehabilitate the road. The project would include approximately 41,000 square feet of slurry seal, 1,500 lineal feet of crack sealing, and approximately 375 tons of asphalt overlay. The anticipated cost to complete the construction of this maintenance and rehab project is approximately $140,000.

Table 3-3 Summary of Priority 1 CIPs

Priority	Street	Construction	Contingency (20%)	Engineering (20%)	Legal & Admin (5%)	Total
P1-1	North Pacific	$1,350,000	$270,000	$324,000	$81,000	$2,025,000
P1-2	S Pacific	$256,000	$51,200	$61,440	$15,360	$384,000
P1-3	S Crest Terrace	$170,000	$34,000	$40,800	$10,200	$255,000
P1-4	S Nehalem	$105,000	$21,000	$25,200	$6,300	$157,500
P1-5	NE Lake	$145,000	$29,000	$34,800	$8,700	$217,500
P1-6	S Pacific View Dr	$125,000	$25,000	$30,000	$7,500	$187,500
P1-7	S Anchor St	$115,000	$23,000	$27,600	$6,900	$172,500

3.2.3 Priority 2 Capital Improvement Projects

Priority 2 capital improvement projects are still considered of high priority as the City should aim to complete them within the next five years. However, these projects may face uncertainty in funding or lack the risk associated with priority 1 projects. Priority 2 projects include:

P2-1. North 3rd Avenue between North Dolphin Street and North Grayling Street
P2-2. South Pacific Street between South 2nd Avenue and South 3rd Avenue
P2-3. South Dolphin Street between South 2nd Avenue and South 3rd Avenue
P2-4. Southeast Kesterson Ct from South Pacific View Drive west to the End
P2-5. South Home Court from South Pacific View Drive west to the End
P2-6. North Miller Street between NE 1st Street and NW 20th Avenue
P2-7. South Quadrant Street between South 2nd Avenue and South 4th Avenue

P2-1 North 3rd Avenue from N Dolphin St to N Grayling St

North 3rd Avenue is a highly trafficked road due to the residential traffic, the presence of Jim Mudd Field, and the Neah-Kah-Nie School District offices. A recent overlay was completed beginning at the east end of the school district driveway and continuing east. This section of road is in good condition except for isolated transverse cracks. The section of road from the east side of the district office driveway to Grayling St should be crack and slurry sealed to extend its useful life. It is anticipated to need approximately 300 ft of crack seal and 4,600 SF of slurry seal.

From the east side of the district office driveway west to Dolphin Street, a one-inch leveling course should be placed to fill in existing potholes. A tack coat should be applied with an overlay geotextile and a two-inch overlay completed to restore the street condition. In total this section of road is anticipated to need approximately 200 tons of asphalt. The total anticipated construction cost for this project is approximately $80,000.

P2-2 S Pacific St from S 2nd Ave to S 3rd Ave

Longitudinal cracking and raveling are the primary concerns of this section of S Pacific Street. The road has multiple quarter or third street restorations as the road is visually divided by patches. There are longitudinal cracks that run up and down the street suggesting joint failures from previous patches. The asphalt binder has deteriorated from age leaving significant surface raveling of the asphalt. The crown of the road is at roughly the same elevation as the sidewalk to the east, likely due to the multiple overlays. It is not recommended to add another overlay to the existing asphalt as that would create dramatic cross slopes on the road. Instead, a grind and inlay would be the recommended solution for this stretch of road. This project would propose approximately 2500 square yards of cold plane pavement removal and two inches of new hot mix asphalt pavement. The estimated construction cost for this work is $150,000.

P2-3 S Dolphin St from S 2nd Ave to S 3rd Ave

South Dolphin Street is experiencing significant raveling due to the presumed age of the road. There is also considerable fatigue cracking present. There are several potholes present closer to S 2nd Ave that have been patched. The existing asphalt should not be relied upon for much structural support but will not require much leveling. A three-inch overlay is recommended for this section of asphalt with a tack coat and overlay geotextile placed beneath the new wearing course. The cost to construct the proposed improvements is estimated at $110,000.

P2-4 SE Kesterson Ct from S Pacific View Dr West to End

Kesterson Court is similarly a borderline overlay project. Due to the road geometry, an overlay would not be recommended for the risk of future pavement failure. Large-diameter rocks are visible through the street surfacing, suggesting the road base needs to be upgraded. This project proposes the removal of twelve inches of existing material, placement of eight inches of ¾"-0" aggregate base, followed by four inches of new asphalt surfacing. The total anticipated construction costs are approximately $90,000.

P2-5 S Home Ct from S Pacific View Dr West to End

Due to the rock placed on top of the existing asphalt, it was not possible to inspect the condition of the subsurface asphalt. The placement of the rock on top of the asphalt suggests the existing asphalt is no longer in adequate condition. The existing gravel appears to be between one and three inches in depth. Due to the lack of established compact gravel, it is recommended to remove the gravel and asphalt and rebuild the road surface. The top twelve inches of material should be removed and replaced with eight inches of new ¾"-0" aggregate base and four inches of asphalt surfacing. The anticipated construction costs are estimated at $75,000.

P2-6 N Miller St from NE 1st St to NW 20th Ave

North Miller Street appears to be overlayed in various areas. There are isolated areas of cracking and minor raveling of the wearing surface. The road appears to be in generally good condition. However, the road is also close to the ocean and sees considerable traffic. This increases the need for routine maintenance. It is recommended to complete a crack and slurry seal project on N Miller. The cost to complete the proposed maintenance project is approximately $125,000.

P2-7 S Quadrant St from S 2nd Ave to S 4th Ave

South Quadrant appears to be recently paved with minimal to no surface deformation present. The road does not currently require any significant maintenance. However, completing a slurry seal project every 8-10 years will dramatically increase the lifespan of City streets. It is anticipated that by the end of the 5-year planning period, S Quadrant will need maintenance. The anticipated construction cost to complete a slurry seal project is $20,000.

Table 3-4 Summary of Priority 2 CIPs

Priority	Street	Construction	Contingency (20%)	Engineering (20%)	Legal & Admin (5%)	Total
P2-1	N 3rd Ave	$65,000	$13,000	$15,600	$3,900	$97,500
P2-2	S Pacific St	$125,000	$25,000	$30,000	$7,500	$187,500
P2-3	S Dolphin St	$90,000	$18,000	$21,600	$5,400	$135,000
P2-4	SE Kesterson Ct	$75,000	$15,000	$18,000	$4,500	$112,500
P2-5	S Home Ct	$60,000	$12,000	$14,400	$3,600	$90,000
P2-6	N Miller St	$105,000	$21,000	$25,200	$6,300	$157,500
P2-7	S Quadrant St	$15,000	$3,000	$3,600	$900	$22,500

3.2.4 New Asphalt Road Capital Improvement Projects

Six residential streets were reviewed for conversion from gravel to asphalt. These streets were included due to the condition of the gravel surfacing and buried utilities. Streets in this section have been prioritized based on their anticipated impact as well as the extent of drainage improvements needed. It should be noted that the streets included in this section are currently in good condition. So long as the gravel surfacing continues to be maintained as well as it has been, these projects can be completed when funds are available with limited urgency. All new asphalt roads should be constructed with a minimum road section of nine inches of ¾"-0" crushed aggregate base and four inches of level 2 hot mix asphalt concrete pavement. The top four inches of the existing gravel road should be removed and replaced with clean base material before placing new asphalt. This is done as imperfections tend to settle into gravel roads and the fines and larger aggregate separate under repeated tire pressure. Test pits should be dug in numerous locations on each of the streets listed below to determine the thickness of the existing gravel. If a minimum of nine inches of gravel exists, the City can simply replace the top four inches of gravel with four inches of fresh aggregate base. Should roads have less than nine inches of gravel present, the top nine inches of material should be removed, and a new road section rebuilt. This report assumes each of the roads below has a minimum of nine inches of suitable aggregate base.

P3-1 South Quadrant Street and South Palisade Street from S Nehalem Ave to S 2nd Ave

South Palisade and South Quadrant are residential through streets providing access to fourteen homes each. South Quadrant Street obtains water service from a twelve-inch PVC water main while South Palisade Street is served from a four-inch main. Typically, a four-inch main would be a little undersized. However, this main is looped, meaning it connects to an eight-inch main on South 2nd Avenue and a six-inch main on South Nehalem. This means the main will be able to provide more consistent and higher pressured service. Additionally, city staff has noted this main is in good condition. Both Palisades and Quadrant are served by two dead-end eight-inch PVC sewer mains each, providing sufficient capacity.

Before completing the construction, the City should complete potholing as described above. Assuming a sufficient gravel section exists, the top four inches of gravel should be removed and replaced with clean aggregate base followed by four inches of pavement.

One additional improvement that should be made is the rehabilitation of the asphalt on South Nehalem Avenue between South Quadrant and South Palisade. The asphalt between these two streets has a significant longitudinal crack running the length of the centerline of the road. Fatigue cracks, patch failures, and delamination create an uneven wearing surface near Palisade. Additionally, the rim of the manhole near Quadrant Street protrudes approximately one inch above the wearing surface. This section of road should have a one-inch leveling course, tack coat, overlay geotextile, and two-inch overlay placed. The cost to construct this project is estimated at $305,000.

P3-2 Cedar Creek Circle from N Marine St to Timberlake Drive

Cedar Creek Circle is a residential through street just southeast of Lake Lytle. With buildout achieved and an eight-inch water main constructed, the road is a candidate for conversion from gravel to asphalt. Similarly to Quadrant and Palisade, the road should be potholed in multiple locations to determine the depth and condition of the existing gravel. Should a minimum of nine inches of gravel be present, the top four inches should be removed and replaced with four inches of clean compacted ¾"-0" aggregate base before pouring four inches of level 2 hot mix asphalt concrete pavement. The anticipated cost to construct these improvements is approximately $140,000.

P3-3 South Front St & S Anchor St from S 6th Ave to the End

Due to their size and proximity, Front and Anchor Streets were combined into one project. Both have adequate drainage, though some improvements to the road geometry may be required to facilitate storm drainage. Potholing should be completed to determine the depth of the existing gravel and determine suitability for reuse of the existing base rock. Assuming the gravel base is sufficient, replace the top four inches of gravel with clean base material and place four inches of new asphalt surfacing. The anticipated cost to construct this project is approximately $110,000.

P3-4 South Pacific Street from S 6th Ave to S 7th Ave

A small residential street on the southwest side of town, S Pacific St is an ideal candidate to convert to an asphalt road. The buried utilities have been upgraded and no unbuilt lots are remaining. One key issue with this road is the difficulty of drainage, which is why this street is listed as a P3-4 project. Storm drainage on this right of way infiltrates through the road surface and ponds on the right of way, just off the road surface. Placing asphalt on this road will direct more runoff off the road and ponding on at the edges of the right of way will increase. Drainage ditches or catch basins should be placed to capture runoff and direct it away from private property. If the City installs a storm system before this project, it will move up on the priority list. The cost to construct this work without storm system improvements is approximately $105,000. If storm system improvements are added to this project, the anticipated cost is $240,000.

Table 3-5 Summary of Priority 3 CIPs

Priority	Street	Construction	Contingency (20%)	Engineering (20%)	Legal & Admin (5%)	Total
P3-1	S Quadrant St & S Palisade St	$255,000	$51,000	$61,200	$15,300	$382,500
P3-2	Cedar Creek Circle	$116,000	$23,200	$27,840	$6,960	$174,000
P3-3	S Front St & S Anchor St	$90,000	$18,000	$21,600	$5,400	$135,000
P3-4	S Pacific St	$197,000	$39,400	$47,280	$11,820	$295,500

3.3 MAINTENANCE OPTIONS

Due to the harsh environment, the City may want to consider an annual maintenance program aimed at extending the life of newly paved roads. Slurry coats can be applied every eight to ten years to extend the asphalt surface's life. A slurry seal is composed of water, small aggregate, emulsion, and filler. Asphalt roads have a standard design life of twenty years and utilizing maintenance programs has been known to extend the useful life of the road well beyond the design life.

According to a study completed by Purdue University in conjunction with the Indiana Department of Transportation, the pavement will see a 40% drop in quality over the first fifteen years of its life. In the following two and a half years, the pavement quality will drop an additional 40% with the final 20% deterioration coming in the final two and a half years of useful life. The goal of preventative pavement maintenance is to complete projects in the first fifteen years of the pavement's life to extend its useful life beyond twenty years.

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SECTION 4

Finance Plan

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4.3 EXACTION (CONDITIONS OF DEVELOPMENT)

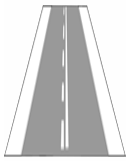
System improvements can be required as a condition of development. The process requires the City to demonstrate how the improvements required are necessary to accommodate that impact generated by the new development.

4.4 MISCELLANEOUS

There are other mechanisms available to finance projects. Gas tax and vehicle registration fees are the most traditional methods. Local jurisdictions do have authority to impose local gas taxes.

Some economic development programs also offer a source of funds. The Immediate Opportunity Grant Program managed by ODOT provides a maximum of $500,000 for public road work associated with an economic development related project of regional significance, provided the underlying project creates primary employment. Additionally, although lesser amounts will be considered, the grantee should provide an equal local match. Another economic development related source of funds is the Special Public Works Fund. This fund provides grants and loans for public work that supports private projects resulting in permanent job creation or job retention. The maximum grant is $500,000 but may not exceed 85% of the project cost.

Another ODOT-funded grant program is called the Small City Allotment (SCA) program. The SCA grant can provide a maximum of $250,000 for eligible cities having populations of 5,000 or fewer per the most recent census. Funding may only be used upon streets that are inadequate for the capacity they serve or are in condition detrimental to safety.



APPENDIX A

Street Assessment Form

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Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	N 3rd
Begin Cross Street	N Grayling
End Cross Street	N Dolphin
Intersection	
Inspected By	MCD
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☑
Block Cracking	☐	☐	☑	☐
Longitudinal/Transverse Cracking	☐	☑	☐	☐
Edge Cracking	☐	☑	☐	☐
Joint Reflection Cracking	☐	☑	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☑	☐
Raveling	☐	☐	☐	☑
Rutting	☐	☑	☐	☐

Notes

From Grayling to west side of school office, okay with minimal transverse cracks

W side of district office to N Dolphin significantly deteriorates

Very bad alligatoring, bad raveling

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	N Miller
Begin Cross Street	NW 20th
End Cross Street	NE 1st
Intersection	
Inspected By	MCD
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☑	☐	☐
Block Cracking	☑	☐	☐	☐
Longitudinal/Transverse Cracking	☐	☑	☐	☐
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☑	☐	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☑	☐	☐
Raveling	☐	☑	☐	☐
Rutting	☑	☐	☐	☐

Notes

North of 20th is neatly paved

19th to 12th has lost some HMA, but minimal cracking or surface deformation, maybe a maintenance slury seal

12th South is either brand new or in great condition

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	N Pacific St
Begin Cross Street	N 3rd Ave
End Cross Street	NW 9th Ave
Intersection	
Inspected By	MCD
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☑	☐
Block Cracking	☐	☐	☐	☑
Longitudinal/Transverse Cracking	☐	☐	☐	☑
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☐	☐	☑	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☑	☐
Raveling	☐	☐	☑	☐
Rutting	☑	☐	☐	☐

Notes

Road condition deteriorates as you travel north

Raveling is fair to poor depending on area

Larger concern of block cracking as well as longitudinal/transverse cracking allowing water intrusion to damage road base

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	NE Lake Blvd
Begin Cross Street	NE 12th Ave
End Cross Street	NE 15th St
Intersection	
Inspected By	MCD
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☑
Block Cracking	☐	☐	☐	☑
Longitudinal/Transverse Cracking	☐	☐	☐	☑
Edge Cracking	☐	☐	☑	☐
Joint Reflection Cracking	☐	☑	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☐	☑
Raveling	☐	☑	☐	☐
Rutting	☑	☐	☐	☐

Notes

Raveling isn't as bad as other areas of town

Very poor alligator cracking

Many potholes have been patched, many more present

Edge cracking on W side of road

Worst condition near 13th & 14th

Very poor alligator with fair raveling suggests the asphalt isn't as old as other areas. With the extreme fatigue cracks, read base likely needs to be rebuilt

Photos

Street Assessment

HBH CONSULTING ENGINEERS

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Anchor St
Begin Cross Street	S 2nd Ave
End Cross Street	S 5th Ave
Intersection	
Inspected By	MCD
Inspection Date	12/05/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☑	☐
Block Cracking	☐	☐	☑	☐
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☐	☐	☑	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☑	☐	☐	☐
Raveling	☐	☐	☐	☑
Rutting	☑	☐	☐	☐

Notes

- S 3rd to S 4th in poor shape
  - Very poor alligator cracking
  - Very poor block cracking
  - Very poor raveling
  - Overlay candidate
- S 2nd to S 3rd
  - Minor raveling
  - Centerline longitudinal crack, very deep
- S 4th to S5th
  - Minor raveling
  - A couple cracks to seal

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Crest Terrace / Terrace Dr
Begin Cross Street	S Pacific View Dr
End Cross Street	NW to End
Intersection	
Inspected By	MCD
Inspection Date	12/5/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☑
Block Cracking	☐	☐	☐	☑
Longitudinal/Transverse Cracking	☐	☐	☐	☑
Edge Cracking	☐	☐	☑	☐
Joint Reflection Cracking	☐	☐	☐	☑
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☐	☑
Raveling	☐	☐	☐	☑
Rutting	☑	☐	☐	☐

Notes

Extreme raveling

Potholes towards top of hill

Many patches are unraveling

Asphalt lifts are separating

Road likely needs to be rebuilt

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Dolphin St
Begin Cross Street	S 2nd Ave
End Cross Street	S 3rd Ave
Intersection	
Inspected By	MCD
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☑	☐
Block Cracking	☐	☐	☑	☐
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☐	☑	☐	☐
Joint Reflection Cracking	☐	☑	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☑	☐
Raveling	☐	☐	☑	☐
Rutting	☑	☐	☐	☐

Notes

A few potholes have been patched mostly along the centerline

Centerline longitudinal cracking suggests joint failure (likely caused some of the potholing)

Alligatoring is present in areas, particarly the northern half

Some joint failure @ S 2nd St

Asphalt is showing age through wear

Photos

Street Assessment

HBH CONSULTING ENGINEERS

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Home St
Begin Cross Street	S Pacific View Dr
End Cross Street	W to End
Intersection	
Inspected By	MCD
Inspection Date	12/05/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☐
Block Cracking	☐	☐	☐	☐
Longitudinal/Transverse Cracking	☐	☐	☐	☐
Edge Cracking	☐	☐	☐	☐
Joint Reflection Cracking	☐	☐	☐	☐
Polished Aggregate	☐	☐	☐	☐
Potholes	☐	☐	☐	☐
Raveling	☐	☐	☐	☐
Rutting	☐	☐	☐	☐

Notes

Asphalt surface has been replaced with gravel

Found some asphalt ~ 1 inch deep, unable to inspect condition, assumed poor

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☐ Street ☑ Intersection
Street Name	
Begin Cross Street	S Nehalem Ave
End Cross Street	S Juniper St
Intersection	
Inspected By	MCD
Inspection Date	12/05/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☑
Block Cracking	☐	☐	☐	☑
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☐	☐	☑	☐
Joint Reflection Cracking	☐	☐	☐	☑
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☐	☑
Raveling	☐	☐	☐	☑
Rutting	☐	☐	☑	☐

Notes

Significant loss of wearing surface

Extreme alligator cracking

Many potholes that have been patched suggest base issues

Cold patches at valve cans are reflective cracking

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Pacific
Begin Cross Street	S 2nd
End Cross Street	S 3rd
Intersection	
Inspected By	Matt Del Moro
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☑	☐	☐
Block Cracking	☐	☐	☑	☐
Longitudinal/Transverse Cracking	☐	☐	☐	☑
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☐	☐	☐	☑
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☑	☐	☐
Raveling	☐	☐	☑	☐
Rutting	☑	☐	☐	☐

Notes

Minimal potholes, but many low points that suggests patched potholes.

Minimal deep ravelling. However, much of the HMA surface is gone. Wide spread warly ravelling in very bad condition.

Longitudinal cracks the entire way divide the road into thirds/fourths.

Very bad patching & sinking at patches

Photos

Street Assessment

HBH CONSULTING ENGINEERS

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Pacific
Begin Cross Street	S 3rd
End Cross Street	S 4th
Intersection	
Inspected By	Matt Del Moro
Inspection Date	2/27/2024

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☑	☐
Block Cracking	☐	☐	☑	☐
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☐	☐	☐	☑
Polished Aggregate	☑	☐	☐	☐
Potholes	☐	☐	☐	☑
Raveling	☐	☐	☐	☑
Rutting	☑	☐	☐	☐

Notes

- Asphalt very disjointed, lots of patches
- No smooth drivable surface
- Pot holes and depressions all over the road
- Driveways don't line up with elevation of road surface
- Minimal longitudinal cracks, very poor transverse cracking
- HMA surface mostly gone, lots of exposed asphalt
- Suggests road base okay, drain very very poor
- Even worse on S 4th to Miller St

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Pacific View Dr
Begin Cross Street	Hillside Drive
End Cross Street	South to End
Intersection	
Inspected By	MCD
Inspection Date	12/5/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☐	☑
Block Cracking	☐	☑	☐	☐
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☐	☑	☐	☐
Joint Reflection Cracking	☐	☐	☑	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☑	☐	☐	☐
Raveling	☐	☐	☐	☑
Rutting	☑	☐	☐	☐

Notes

- Patches of asphalt to fill potholes & depressions
- Poor drainage on both sides of the road
- Alligator cracks forming at top of hill
- Joint failure at joint with Hillside Dr
- Very poor raveling of surface asphalt
- Minor longitudinal cracks at bottom of road (asphalt portion)
- Bottom half of the hill seems to be gravel placed on top of asphalt

Photos

Street Assessment

HBH CONSULTING ENGINEERS

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	S Quadrant St
Begin Cross Street	S 2nd Ave
End Cross Street	S 4th Ave
Intersection	
Inspected By	MCD
Inspection Date	12/05/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☑	☐	☐	☐
Block Cracking	☑	☐	☐	☐
Longitudinal/Transverse Cracking	☑	☐	☐	☐
Edge Cracking	☑	☐	☐	☐
Joint Reflection Cracking	☑	☐	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☑	☐	☐	☐
Raveling	☐	☑	☐	☐
Rutting	☑	☐	☐	☐

Notes

Early wear of surface

Probably okay for a few years

Maintenance slurry seal wouldn't hurt

Photos

Street Assessment

Owner information

Name	City of Rockaway Beach
Address	276 Hwy 101
City, State ZIP	Rockaway Beach, OR. 97136
Phone	(503) 374-1752
Email	publicworks@corb.us
Project name	Rockaway Beach Street Capital Improvements Plan

Inspection Information

Street/Intersection	☑ Street ☐ Intersection
Street Name	SE Kesterson Ct
Begin Cross Street	S Pacific View Dr
End Cross Street	End
Intersection	
Inspected By	MCD
Inspection Date	12/5/2023

Condition Assessment	Good	Fair	Poor	Very Poor
Alligator Cracking	☐	☐	☑	☐
Block Cracking	☐	☑	☐	☐
Longitudinal/Transverse Cracking	☐	☐	☑	☐
Edge Cracking	☐	☐	☑	☐
Joint Reflection Cracking	☐	☑	☐	☐
Polished Aggregate	☑	☐	☐	☐
Potholes	☑	☐	☐	☐
Raveling	☐	☐	☐	☑
Rutting	☑	☐	☐	☐

Notes

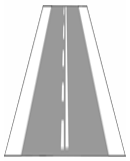
Significant raveling in surface asphalt

Asphalt delamination occuring at midpoint of hill

Appears to be poured on top of concrete?

Asphalt @ base of hill converted to gravel

Photos



APPENDIX B

Project Cost Estimates

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Cost Estimates for Street Capital Improvements

P1-1 North Pacific Street from North 3rd Avenue to Northwest 9th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, and Insurance	1	LS	$107,734	$107,734
2	Erosion Control, Restoration, Reseeding, and Cleanup	1	LS	$4,000	$4,000
3	Traffic Control	1	LS	$5,000	$5,000
4	Water Service Connection	80	EA	$500	$40,000
5	3" Level 2 HMAC	1800	TN	$185	$333,000
6	Shoulder Rock	400	CY	$75	$30,000
7	Adjust Manholes & Cleanouts	14	EA	$2,500	$35,000
8	Adjust Catch Basins	3	EA	$3,500	$10,500
9	Adjust Valve Cans	27	EA	$750	$20,250
10	Asphalt Street Transitions	8	EA	$3,500	$28,000
11	Asphalt/Concrete Driveway Transitions	1	LS	$125,000	$125,000
12	8" PVC C900 - Granular Backfill	3200	LF	$105	$336,000
13	Water Service Pipe	1800	LF	$45	$81,000
14	Connect to Existing	7	EA	$3,000	$21,000
15	Abandon Existing Facilities	1	LS	$6,500	$6,500
16	Fire Hydrants	8	EA	$6,000	$48,000
17	8" Gate Valves	30	EA	$3,600	$108,000

Construction Subtotal	$1,338,984.4
Contingency (20%)	$267,796.9
Construction Total	$1,606,781.3
Engineering (15%)	$241,017
Legal & Admin (5%)	$80,339
Total	$1,928,138

P1-2 South Pacific Street from South 3rd Avenue to South 4th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$19,811	$19,811
2	Traffic Control	1	LS	$5,000	$5,000
3	Asphalt	203	TN	$175	$35,525
4	Surface Restoration & Cleanup	1	LS	$5,000	$5,000
5	Saw Cutting	1780	LF	$5	$8,900
6	8" PVC Water Main	739	LF	$115	$84,985
7	8" Gate Valve	5	EA	$4,000	$20,000
8	Fire Hydrant Assembly	1	EA	$10,000	$10,000
9	Install Water Service and Reconnect to Existing Meter	26	EA	$1,500	$39,000
10	Cut, Cap, and Abandon Existing Water Main	3	EA	$2,000	$6,000
11	Connect to Existing Water Main	3	EA	$4,000	$12,000

Construction Subtotal	$246,221
Contingency (20%)	$49,244.18
Construction Total	$295,465.05
Engineering (20%)	$59,093.01
Legal & Admin (5%)	$14,773.25
Total	$369,331.31

P1-3 South Crest Terrace from South Terrace Drive to the End

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$13,671.88	$13,671.88
2	Traffic Control	1	LS	$7,500.00	$7,500.00
3	Full Depth Restoration (remove and place 8" of 3/4")	12500	SF	$4.50	$56,250.00
4	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	500	TN	$185.00	$92,500.00

Construction Subtotal	$169,921.88
Contingency (20%)	$33,984.38
Construction Total	$203,906.25
Engineering (20%)	$40,781.25
Legal & Admin (5%)	$10,195.31
Total	$254,882.81

P1-4 South Nehalem Avenue from South Juniper Street to 300 ft east

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$8,443.75	$8,443.75
2	Traffic Control	1	LS	$5,000.00	$5,000.00
3	Full Depth Restoration (remove and place 8" of 3/4")	8000	SF	$4.50	$36,000.00
4	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	300	TN	$185.00	$55,500.00

Construction Subtotal	$104,943.75
Contingency (20%)	$20,988.75
Construction Total	$125,932.50
Engineering (20%)	$25,186.50
Legal & Admin (5%)	$6,296.63
Total	$157,415.63

P1-5 Northeast Lake Boulevard from Northeast 12th Avenue to Northeast 15th Street

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$11,361.88	$11,361.88
2	Traffic Control	1	LS	$7,500.00	$7,500.00
3	Full Depth Restoration (remove and place 8" of 3/4")	6300	SF	$4.50	$28,350.00
4	3" Level 2 HMA	400	TN	$185.00	$74,000.00
5	Street Transitions	4	EA	$5,000.00	$20,000.00

Construction Subtotal	$141,211.88
Contingency (20%)	$28,242.38
Construction Total	$169,454.25
Engineering (20%)	$33,890.85
Legal & Admin (5%)	$8,472.71
Total	$211,817.81

P1-6 South Pacific View Drive from Hillside Drive south to the end

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$10,106.25	$10,106.25
2	Traffic Control	1	LS	$2,500.00	$2,500.00
3	Full Depth Restoration (remove and place 8" of 3/4")	9200	SF	$4.50	$41,400.00
4	Street Transitions	1	EA	$5,000.00	$5,000.00
5	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	360	TN	$185.00	$66,600.00

Construction Subtotal	$125,606.25
Contingency (20%)	$25,121.25
Construction Total	$150,727.50
Engineering (20%)	$30,145.50
Legal & Admin (5%)	$7,536.38
Total	$188,409.38

P1-7 South Anchor Street from South 2nd Avenue to South 5th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$9,045.31	$9,045.31
2	Traffic Control	1	LS	$5,000.00	$5,000.00
3	3" Level 2 HMA	375	TN	$185.00	$69,375.00
4	Street Transitions	2	EA	$3,500.00	$7,000.00
5	Slurry Seal	41000	SF	$0.50	$20,500.00
6	Crack Seal	1500	LF	$1.00	$1,500.00

Construction Subtotal	$112,420.31
Contingency (20%)	$22,484.06
Construction Total	$134,904.38
Engineering (20%)	$26,980.88
Legal & Admin (5%)	$6,745.22
Total	$168,630.47

P2-1 North 3rd Avenue from North Dolphin Street to North Grayling Street

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$5,289.38	$5,289.38
2	Traffic Control	1	LS	$5,000.00	$5,000.00
3	3" Level 2 HMA	200	TN	$200.00	$40,000.00
4	Street Transitions	4	EA	$3,500.00	$14,000.00
5	Slurry Seal	4600	SF	$0.25	$1,150.00
6	Crack Seal	300	LF	$1.00	$300.00
		Construction Subtotal			$65,739.38
		Contingency (20%)			$13,147.88
		Construction Total			$78,887.25
		Engineering (20%)			$15,777.45
		Legal & Admin (5%)			$3,944.36
		Total			$98,609.06

P2-2 South Pacific Street from South 2nd Avenue to South 3rd Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$9,935.63	$9,935.63
2	Traffic Control	1	LS	$4,500.00	$4,500.00
3	2" Level 2 HMA	430	TN	$185.00	$79,550.00
4	Cold Plane Pavement Removal	2500	SY	$9.00	$22,500.00
5	Street Transitions	2	EA	$3,500.00	$7,000.00
		Construction Subtotal			$123,485.63
		Contingency (20%)			$24,697.13
		Construction Total			$148,182.75
		Engineering (20%)			$29,636.55
		Legal & Admin (5%)			$7,409.14
		Total			$185,228.44

P2-3 South Dolphin Street from South 2nd Avenue to South 3rd Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$7,076.56	$7,076.56
2	Traffic Control	1	LS	$4,500.00	$4,500.00
3	3" Level 2 HMA	375	TN	$185.00	$69,375.00
4	Street Transitions	2	EA	$3,500.00	$7,000.00
		Construction Subtotal			$87,951.56
		Contingency (20%)			$17,590.31
		Construction Total			$105,541.88
		Engineering (20%)			$21,108.38
		Legal & Admin (5%)			$5,277.09
		Total			$131,927.34

P2-4 Southeast Kesterson Court from South Pacific View Drive to the end

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$5,880.00	$5,880.00
2	Traffic Control	1	LS	$3,500.00	$3,500.00
3	Full Depth Restoration (remove and place 8" of 3/4")	4600	SF	$4.50	$20,700.00
4	3" Level 2 HMA	180	TN	$200.00	$36,000.00
5	Street Transitions	2	EA	$3,500.00	$7,000.00
		Construction Subtotal			$73,080.00
		Contingency (20%)			$14,616.00
		Construction Total			$87,696.00
		Engineering (20%)			$17,539.20
		Legal & Admin (5%)			$4,384.80
		Total			$109,620.00

P2-5 South Home Court from South Pacific View Drive to the end

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$4,659.38	$4,659.38
2	Traffic Control	1	LS	$2,500.00	$2,500.00
3	Full Depth Restoration (remove and place 8" of 3/4")	3500	SF	$4.50	$15,750.00
4	3" Level 2 HMA	140	TN	$200.00	$28,000.00
5	Street Transitions	2	EA	$3,500.00	$7,000.00
		Construction Subtotal			$57,909.38
		Contingency (20%)			$11,581.88
		Construction Total			$69,491.25
		Engineering (20%)			$13,898.25
		Legal & Admin (5%)			$3,474.56
		Total			$86,864.06

P2-6 North Miller Street from Northeast 1st Street to Northwest 20th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$8,312.50	$8,312.50
2	Traffic Control	1	LS	$12,500.00	$12,500.00
3	Slurry Seal	140000	SF	$0.50	$70,000.00
4	Crack Seal	12500	LF	$1.00	$12,500.00
		Construction Subtotal			$103,312.50
		Contingency (20%)			$20,662.50
		Construction Total			$123,975.00
		Engineering (20%)			$24,795.00
		Legal & Admin (5%)			$6,198.75
		Total			$154,968.75

P2-7 South Quadrant Street from South 2nd Avenue to South 4th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$1,181.25	$1,181.25
2	Traffic Control	1	LS	$3,500.00	$3,500.00
3	Slurry Seal	20000	SF	$0.50	$10,000.00
		Construction Subtotal			$14,681.25
		Contingency (20%)			$2,936.25
		Construction Total			$17,617.50
		Engineering (20%)			$3,523.50
		Legal & Admin (5%)			$880.88
		Total			$22,021.88

P3-1 South Quadrant Street & South Palisade Street from South Nehalem Ave to South 2nd Ave

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$20,551.56	$20,551.56
2	Traffic Control	1	LS	$7,500.00	$7,500.00
3	3" Level 2 HMA	125	TN	$200.00	$25,000.00
4	Street Transitions	4	EA	$3,500.00	$14,000.00
5	Remove 8" ex. Gravel	400	CY	$20.00	$8,000.00
6	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	975	TN	$185.00	$180,375.00
		Construction Subtotal			$255,426.56
		Contingency (20%)			$51,085.31
		Construction Total			$306,511.88
		Engineering (20%)			$61,302.38
		Legal & Admin (5%)			$15,325.59
		Total			$383,139.84

P3-2 Cedar Creek Circle from North Marine Street to Timberlake Drive

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$9,371.25	$9,371.25
2	Traffic Control	1	LS	$7,500.00	$7,500.00
3	Street Transitions	1	EA	$3,500.00	$3,500.00
4	Remove 8" ex. Gravel	180	CY	$20.00	$3,600.00
5	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	500	TN	$185.00	$92,500.00

Construction Subtotal	$116,471.25
Contingency (20%)	$23,294.25
Construction Total	$139,765.50
Engineering (20%)	$27,953.10
Legal & Admin (5%)	$6,988.28
Total	$174,706.88

P3-3 South Front Street & South Anchor Street from South 6th Street

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$7,251.56	$7,251.56
2	Traffic Control	1	LS	$3,500.00	$3,500.00
3	Street Transitions	2	EA	$3,500.00	$7,000.00
4	Remove 8" ex. Gravel	150	CY	$20.00	$3,000.00
5	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	375	TN	$185.00	$69,375.00

Construction Subtotal	$90,126.56
Contingency (20%)	$18,025.31
Construction Total	$108,151.88
Engineering (20%)	$21,630.38
Legal & Admin (5%)	$5,407.59
Total	$135,189.84

P3-4 South Pacific Street from South 6th Avenue to South 7th Avenue

Item	Description	Quantity	Unit	Unit Cost	Total Cost
1	Mobilization, Bonding, Insurance	1	LS	$6,978.13	$6,978.13
2	Traffic Control	1	LS	$5,000.00	$5,000.00
3	Street Transitions	2	EA	$3,500.00	$7,000.00
4	Remove 8" ex. Gravel	150	CY	$20.00	$3,000.00
5	4" Level 2 HMA (incl. fabric, 4" 3/4" Crushed Rock, etc)	350	TN	$185.00	$64,750.00
6	12" PVC Storm Main	650	LF	$120.00	$78,000.00
7	Catch Basin	8	EA	$4,000.00	$32,000.00

Construction Subtotal	$196,728.13
Contingency (20%)	$39,345.63
Construction Total	$236,073.75
Engineering (20%)	$47,214.75
Legal & Admin (5%)	$11,803.69
Total	$295,092.19


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