GENERAL DEMOLITION PLAN

for

CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PORT OF ANCHORAGE MARINE TERMINAL REDEVELOPMENT PROJECT

SUPPLEMENTAL SUBMITTAL IN SUPPORT OF
THE RULEMAKING AND LETTERS OF APPLICATION
July 15, 2009 - July 15, 2014

United States Department of Transportation
Maritime Administration
400 Seventh Street, S.W.
Washington, DC 20590

Port of Anchorage
2000 Anchorage Port Road
Anchorage, Alaska 99501

Prepared by

Integrated Concepts & Research Corporation
421 West First Avenue, Suite 200
Anchorage, Alaska 99501

REVISED January 30, 2009

This page intentionally left blank.

GENERAL DEMOLITION PLAN
for
CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE
PORT OF ANCHORAGE MARINE TERMINAL REDEVELOPMENT PROJECT

SUPPLEMENTAL SUBMITTAL IN SUPPORT OF
THE RULEMAKING AND LETTERS OF APPLICATION
July 15, 2009 - July 15, 2014

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

dB	decibel
dBA	A-weighted decibel
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
lb	pound
LF	linear feet
LOA	Letters of Authorization
hr	hour
IHA	Incidental Harassment Authorization
ICRC	Integrated Concepts & Research Corporation
m	meter
MOA	Municipality of Anchorage
ms	millisecond
msec	millisecond
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
POA	Port of Anchorage Administration
POL	petroleum, oils, and lubricants
Port	Port of Anchorage facilities
Project	Marine Terminal Redevelopment Project
RMS	root-mean-square
sq ft	square feet
USACE	United States Army Corps of Engineers

This page intentionally left blank.

1.0 INTRODUCTION

The Marine Terminal Redevelopment Project at the Port of Anchorage, Alaska (the Project) is designed to upgrade and expand the existing Port of Anchorage facilities (Port) by removing and replacing aging and obsolete structures and providing additional dock and backland areas, without disruption of maritime service during construction. This Project includes in-water construction activities that have the potential to adversely impact marine mammals within Knik Arm, upper Cook Inlet, Alaska. Figure 1-1 shows the aerial view of the marine terminal and existing dock.

In accordance with Code of Federal Regulations (CFR) 216, the Port of Anchorage Administration (POA) and lead federal action agency, the U.S. Department of Transportation Maritime Administration (Maritime Administration), have submitted a Rulemaking and Letters of Authorization Application (LOA) in November 2008 to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) for in-water construction activities associated with the Project. The LOA Application (LOA 2008) provides information and evaluation necessary to justify a five-year authorization for the incidental, but not the intentional (Level B behavioral disturbance), multi-year take of marine mammals during in-water demolition and pile driving activities associated with the Project. The LOA Application is submitted to meet the requirements mandated by Section 7 of the Endangered Species Act, the National Environmental Policy Act, and the Marine Mammal Protection Act.

This General Demolition Plan (Demolition Plan) is a supplemental document to the LOA Application and was prepared by Integrated Concepts & Research Corporation (ICRC). ICRC is contracted with the Maritime Administration to provide program and project administration, permitting, planning, design and construction services deemed necessary to complete the Project. This Demolition Plan provides additional detail to the LOA Application Section 1.4.6 Demolition Activities and to Section 11.0 Measures to Reduce Impacts to Marine Mammals. The following sections in this Demolition Plan describe the approaches and options for future demolition of the existing dock structures and the proposed mitigation for each to protect marine mammals in the vicinity of the Port from physical harm and harassment related to demolition activities.

Additional Project information may be obtained from the LOA Application.

2.0 PURPOSE OF THIS PLAN

This Demolition Plan is intended to serve as a supplemental document to the existing LOA Application submitted to NOAA/NMFS in November 2008. The purpose of this Demolition Plan is to provide detail to reviewers regarding the potential demolition approaches, the nature of potential impact to marine mammals, the likely sources of in-water sound, and the proposed mitigation to prevent or minimize Level B takes of marine mammals. NOAA/NMFS is requested to provide guidance in the permitting process associated with the proposed mitigation measures in this Demolition Plan. Regulators may use this information to prepare the Rulemaking requested in the LOA Application.

Demolition of the existing, active docks is one part of the greater Project which spans over a decade. Dock demolition is currently scheduled to begin in 2010 and could continue intermittently through 2013, depending on the demolition approach and sequencing selected.

Demolition options have been developed to allow flexibility in accomplishing the demolition work while establishing appropriate mitigation.

The actual field work will not occur for two years from the preparation of this document. The general approaches and parameters are outlined in this Demolition Plan and will be specified in greater detail in future construction bidding documents. However, the specific means and methods to complete the work within these parameters will be defined by the successful construction subcontractor. The final selected option will be influenced by the technical feasibility of applying the appropriate sound mitigation, available funding, and schedule integration requirements with other components of the Project. The demolition subcontractor will be required to submit a specific Demolition Plan to ICRC for approval prior to implementation.

3.0 APPLICABLE PERMITS

The POA is conducting current Project activities as defined in the Department of the Army Permit (POA-2003-502-N) issued by the United States Corps of Engineers (USACE) in August 2007. This permit authorizes the discharge of fill material into the intertidal and near shore subtidal waters of Knik Arm necessary for the construction of the expanded marine terminal. Current Project activities are being conducted in accordance with the Special Conditions of the USACE Section 404/10 Permit and as modified by the one-year Incidental Harassment Authorization (IHA) Permit issued by NMFS in July 2008.

4.0 BACKGROUND

The existing 129-acre Port facility is currently operating at or above sustainable practicable capacity for the various types of cargo handled at the facility. Certain elements of the existing Port infrastructure are functionally obsolete and are near or below design safety standards for seismic events, which are common in the region.

The new facility is being constructed in phases to accommodate the shipping industry to avoid impact to day-to-day intermodal transfer operations and ensure continual service to 85 percent of the State; to coincide with USACE on-going annual harbor maintenance program to maintain shipping lanes at the Port during construction; and to align with incremental funding and Port revenues.

5.0 DESCRIPTION OF THE EXISTING DOCK

The existing dock encompasses approximately 400,000 square feet (sq ft) of surface area and is comprised of an 18- to 24-inch thick steel reinforced concrete deck supported by over 4,000 steel piles. Select structural portions of the concrete deck are up to 3½ to 4 feet thick. Pile diameters range from 24 to 48 inches with a wall thickness of 7/16 inch and are filled with gravel. The existing dock structure includes three obsolete container cranes, a three-story combination administration building and warehouse at the southern portion of the dock, steel trestles, catwalks, fuel piping, and miscellaneous utility appurtenances. The face of the dock structure is situated approximately 70 feet above the sea floor where extreme tidal fluctuations provide approximately 35 feet of water depth even during lowest recordable tide stages. Figure 5-1 shows the front view of the existing dock. Port expansion activities will include the demolition of the existing dock structure to allow the placement of gravel fill to extend the functional wharf line approximately 400 feet beyond the existing dock face.

6.0 DEMOLITION APPROACHES/OPTIONS PROPOSED

Demolition of the existing dock will be performed during two primary phases of relatively similar effort and initiated approximately one year apart. Because the dock is still active, construction activities and schedules must be balanced with the necessity of keeping all critical functions and tenants in business. Tenants and utilities must be relocated to other areas at the Port prior to demolition of the old dock and reconstruction of the new dock.

During construction, container operations must relocate to an interim area north of the existing Port, with fully functional off-loading cranes and ramps. Bulk cargo and fuel operations must relocate south of the existing Port near storage facilities for these commodities. As ship-to-shore operations relocate to interim areas during construction, previous facilities will be taken out of service and demolished.

Prior to the demolition of the primary dock structure a thorough site inspection would be conducted to identify hazardous materials that may require abatement. Pipe, wire, and other utility appurtenances will be salvaged, and the buildings and cranes will be dismantled or demolished. All work prior to demolition of the primary dock structure (buildings, utilities, cranes) will be conducted entirely out-of-water. Work would be performed by hand, chipping hammers, small power tools, excavators, and forklifts. The three existing container cranes may be removed and transported for reuse at another location, dismantled in-place, or demolished by felling them onto the deck and cutting them to manageable pieces for recycling. Phase 1 of dock demolition will include the northern portion (approximately 175,000 sq ft) which is currently scheduled for winter of 2010/2011. Phase 1 includes Terminals 2 and 3. Phase 2 would include the southern portion of the dock (approximately 225,000 sq ft) which is currently scheduled for demolition during the winter of 2011/2012. Phase 2 includes Terminal 1 and the petroleum, oils, and lubricants (POL) Terminals 1 and 2 (Figure 1-1).

The existing dock is inside the footprint of the planned Marine Terminal Redevelopment Project. Therefore, all concrete debris from demolition would be in areas already planned to be filled in during the construction of the new dock. See Figure 6-1 for the phasing plan showing the North Replacement and South Replacement dock areas. This figure shows the existing dock completely inside the outer boundaries of the new earth dock face.

A number of demolition approaches were reviewed for this Demolition Plan. The reviews included consideration of the construction season; either winter or summer. The summer season is generally defined as May through October and the winter season is generally November through March. The months of each season are highly dependent upon variable ambient temperatures and ice melt or build up in the Knik Arm. April could be part of either season. The start and end of specific work may also be dependent on completion of activities scheduled prior to demolition. Winter season spans two different calendar years, and therefore starts around November of one year and ends around March of the next year (i.e. winter 2010/2011).

The most economical approach and of shortest duration includes combining mechanical and blasting means over water during winter months. However, the potential adverse effects to marine mammals of blasting over water would necessitate extensive mitigation. Therefore, blasting over water has been eliminated from further consideration and the following three practicable options were identified to minimize the effects of demolition activities to marine mammals:

Option 1 – Demolition of the dock structure over water using mechanical means only.

Option 2 – Construct granular fill dike beyond the existing dock structure to isolate the structure from marine waters prior to demolition. Demolish out-of-water by mechanical and blasting means.

Option 3 – Construct granular fill dike beyond the existing dock structure to isolate the structure from marine waters prior to demolition. Demolish out-of-water by mechanical means only.

Each of the above options is discussed in further detail in this Demolition Plan.

6.1 OPTION 1 – DEMOLITION OF DOCK STRUCTURE OVER WATER USING MECHANICAL MEANS ONLY

This section provides the Option 1 description of work, work duration, the advantages and disadvantages, and impacts to marine mammals.

6.1.1 Description of Work

Option 1 dock demolition by mechanical means requires breaking or sawing the existing concrete away from the steel support structure and cutting or breaking the steel piles. Concrete demolition would be accomplished using hydraulic chipping hammers, concrete cutter jaws and crushers, and shears mounted to large tracked excavators. Additional equipment would be used to grab, cut, or load salvaged steel during demolition activities. Manufacturers cut sheets that show examples of types of equipment and tools are provided in Appendix A. Demolition of the reinforced concrete deck would be performed by excavators working from the surface of the deck. Large excavators with hydraulic hammers or concrete jaws would chip or break the concrete away from the steel support structure and internal reinforcing steel. The concrete would be broken into small pieces and dropped by gravity to the sea floor below, well within the final Project footprint. The concrete debris on the sea floor would be encapsulated with clean fill material and left in place. Alternately, a subcontractor may choose to saw cut the concrete deck into sections and use cranes or large excavators to remove the sections and transport them to shore for further demolition. Concrete would be crushed for use as aggregate elsewhere in the Project. Deck demolition work would begin at the furthest point (waterside) moving toward the shore, and then along access trestles until the final demolition areas are accessible from land. Metal reinforcing steel debris would be segregated and removed with additional excavators and loaded into trucks for removal and recycling. The concrete deck demolition and salvaging of reinforcing steel could occur during any tidal stage.

Steel piles would be cut or broken using heavy equipment as the concrete deck is removed or additional clean granular fill may be placed in the dock area, if necessary, to allow equipment access to remove the remaining steel piles from below the dock. During lower tides the steel piles would be cut using large track mounted excavators with shear attachments or simply bent and broken at least 10 feet below finish grade using excavators with buckets. An alternate access for removal of the steel pile would require use of a tug and barge to approach from the waterside and remove the steel pile after the deck demolition is complete. Salvaged portions of the piles would be removed for recycling. The concrete debris and remaining portions of steel pile would later be encapsulated with clean fill during the construction of the expanded wharf.

Phases 1 and 2 of Option 1 could be accomplished either in the winter or in the summer. Option 1 A is to modify the current interim schedule and demolish the Phase 1 northern portion

in the summer of 2011 and demolish the Phase 2 southern portion in summer 2012. Option 1B is to demolish Phases 1 and 2 in winter 2010/2011 and winter 2011/2012, respectively.

6.1.2 Work Durations

Total demolition activities for Phase 1 (northern portion) are anticipated to continue for duration of approximately 960 hours (60 hours/week x 16 weeks). Demolition of Phase 2 structures (southern portion) is anticipated to take approximately 1,320 hours (60 hours/week x 22 weeks). Concrete demolition activities would be conducted continuously throughout each day; however, steel pile demolition may be limited to low tide durations for ground access. It is assumed that both portions of work would be performed concurrently, although a portion of the concrete deck must be demolished before steel pile demolition can begin, and steel pile demolition may be limited to low tide intervals.

6.1.3 Advantages/Disadvantages

The primary advantage of Option 1 is that concrete demolition activities may be performed during any tidal stage during summer or winter months. Demolition in the winter, however, would be preferred so that gravel fill placement for the new dock could be performed during the following summer months.

Disadvantages include the following:

- In-water work or over water work which requires significant mitigation efforts to minimize the impacts to marine mammals.
- Steel pile demolition may require working in low tide windows thereby limiting the available work hours.
- A barge may be required to access outer piles as there would be over 30 feet of water even at the low tide.
- The use of large and heavy equipment to demolish the deck while working from the deck itself imposes safety concerns inherent with elevated equipment during demolition and logistical challenges for equipment to access, maneuver, and disembark from the structure.
- If the demolition is performed in the summer season, there is a possibility that pile driving may be ongoing during part or all of the activities. The simultaneous work would introduce dual sound sources. This would not be an issue for winter demolition because pile driving is only performed in the summer or fall.
- If demolition is performed in the winter season, ice floes in the water and buildup of ice on the exposed steel present safety hazards to demolition crews and makes the construction process less efficient. Furthermore, visibility conditions are typically poor due to the loss of sunlight and inclement weather, which would reduce the time available for demolition.

6.1.4 Impacts to Marine Mammals

The risks to marine mammals due to Option 1 include physical harm to marine mammals from concrete or steel debris, crane felling, or vessel movement and sound/vibration transmission into the water.

The primary source of in-water sound is anticipated to be vibration from chipping hammers transmitted into the water through the steel piles. Chipping may be similar to vibratory pile

driving, but with significantly reduced energy and; therefore, less energy would radiate into the water. In addition, because of the considerable structural mass of concrete that the vibrations would pass through prior to reaching the water, the energy is expected to attenuate to a minimal level.

Hydraulic crushers are typically quieter than the chipping hammers and are not expected to result in a significant adverse impact. Other cutting tools, such as shears and cutter jaws, do not provide a repetitive sound, nor impart energy directly to the water column or sea floor. These are used for short durations to crush or crack metal and are not expected to create a significant impact.

Details of the proposed mitigation for Option 1 are provided in Section 7.0.

6.2 OPTION 2 – CONSTRUCT GRANULAR FILL DIKE AND DEMOLITION BY MECHANICAL AND BLASTING MEANS

This section provides the Option 2 description of work, work durations, the advantages and disadvantages, and impacts to marine mammals.

6.2.1 Description of Work

Option 2 is comprised of two parts: 1) construct a dike around the existing dock during the summer; and 2) demolish the dock in the winter. The construction of a granular fill dike along the outer limits of the proposed Port expansion area would isolate the existing dock from marine waters allowing demolition to be accomplished out-of-water with a 300-foot land barrier to demolition activities.

This option would require the construction of approximately 2,600 linear feet (LF) of granular fill dike prior to Phase 1 demolition and approximately 2,300 LF prior to Phase 2. The dike would be constructed to an elevation above the highest anticipated tide elevation, would be up to 100 feet wide at the top with approximately 2:1 side slopes. The dike would be constructed of clean granular fill placed by off-road dump trucks and bulldozers and compacted with vibratory rollers, similar to fill activities currently under way. After completion of the dike the contained water will be removed to a depth sufficient to access the limits of the demolition area from below. The proposed dike would be constructed in accordance with current permit conditions with regard to fish protection and provide fish escapement and/or rescue and release from entrapment.

The dike constructed would be inside the footprint of the area already planned and permitted to be filled in with soil to build the future new dock. The sequence of the filling operations would simply be modified to construct the dike first, demolish the dock, and then complete the remainder of the fill. Dike construction would not result in any additional dewatering or habitat loss.

Additional fill may be placed over the exposed sea floor to accommodate access and maneuvering of heavy equipment for final demolition and removal of debris. Summer construction of the dike would be necessary for proper fill placement and compaction and is anticipated to take approximately five months. After dike completion, the dock will be set back approximately 300 feet inland from the water line. Figure 6-2 shows the location of the dikes for Phases 1 and 2 and the existing dock.

This approach would require a modification to the anticipated interim schedule, with demolition taking place in winter months following dike construction activities. Phase 1 dike construction would begin in the spring to early summer 2011; Phase 2 dike construction is scheduled to begin in spring or summer 2012. The first phase of demolition would take place during the winter of 2011/2012 and the second phase would take place during the winter of 2012/2013.

Once the dike is completely constructed to accommodate a specific phase of demolition, the applicable concrete deck structure would then be demolished or partly demolished in sections using precision charges (blasting) to break or loosen the concrete. Blasting would expedite the demolition of the concrete structure and will allow for easier handling and removal of concrete and steel debris using mechanical equipment such as track mounted excavators and dump trucks working from an adjacent section of the deck structure or from below.

Blasting would entail a series of controlled events or shots to demolish the deck in a predetermined sequence of sections. Each section (approximately 30 LF) would be broken up by a single shot event comprised of approximately 150 to 300 charges depending on the size of the section. The section would be prepared by drilling a series of 1-1/4 to 3-inch holes in a grid-like fashion throughout the section footprint. Grid spacing will vary from 2 to 6 feet based on location and concrete thickness. An explosive charge would be placed in each hole, wired to the detonator and covered. Each hole would contain 1/2 to 1 pound (lb) of explosive (no more than 1 lb of explosives would be used for each hole). Additionally, no more than 1 lb of explosives would be detonated within an 8 millisecond (ms) time period.

As standard blasting contractor practice, prior to the commencement of blast demolition, a controlled test blast will be performed on a portion (approximately 1/8) of the first section to verify the blast design and to monitor ground vibration, air overpressure, and water overpressure. Three hydrophones would be used to measure water overpressure outside of the dike structure and three geophones would be used to measure air overpressure along the mainland. Data obtained from the test blast will be extrapolated to model a full section blast. If data from the test blast indicate a potential for noncompliance, the blast design would be modified and a new test blast would be performed. Data will also be collected during each section blast to verify conformance with all applicable sound and air overpressure requirements and to determine if demolition activities require modification.

Sound generated during blasting events is considered impulsive sound. Impulsive sound is defined as having short duration, usually less than one second and of high intensity, with an abrupt onset and rapid decay. Noise generated at the immediate blast source during dock demolition activities is anticipated to be no greater than 110 dB in air. This sound level is based upon the estimated charge size and configuration discussed above. The impulse sound is expected to dissipate rapidly from the source and all noise generated from blasting activities will conform to the City of Anchorage Noise Control Ordinance (See Appendix B for Chapter 15.70, Noise Control). The Anchorage Noise Control Ordinance allows 100, 10, 1 impulses (blast events) to sound limits of 125, 135, and 145 dBA, respectively during a 24-hour period. Section 6.2.2 discusses the anticipated work durations. On average, only one blasting event is likely to occur within a 24-hour period.

For safety reasons, the latest remote programmable detonation equipment would be used. Personnel using the equipment will be able to identify, test, program and fire each detonator. All blasting activities would follow the procedures of an approved blasting plan, the applicable marine mammal harassment mitigation requirements, and the requirements of a health and safety plan outlining the specific requirements for notifying proper authorities, proper signage

and safety equipment to be used, personal protective equipment, aircraft, vehicle and pedestrian control, and pre-blast communication.

After a portion of the concrete deck is fully removed from the steel support piles, an excavator with a bucket and thumb or shear attachment would break or cut and remove the piles to a point at least 10 feet below the design finish grade in the area of the existing dock. The removed portion of each pile would be salvaged for recycling and the remaining portion would be left in place and encapsulated in fill. For safety reasons, blasting would not occur at the same time as the mechanical salvaging or pile driving work.

6.2.2 Work Durations

Phase 1 dike construction is anticipated to take approximately 1,200 hours (six 10-hour days for 5 months). The duration of Phase 2 dike construction is anticipated to be similar.

It is anticipated that the dock would be segregated into approximately 30 LF sections and that there will be one blasting event for each section. On average, there would be one blasting event per day. Each blast is expected to last no more than six seconds. Between 50 and 75 blasting events are estimated for each demolition phase. The duration for mechanical means of demolition of concrete, reinforcing steel and pile, and salvaging is anticipated to be 720 hours (six 10-hour days for 3 months) for Phase 1 and 840 hours (six 10-hour days for 3.5 months) for Phase 2. Therefore, using 75 blasts for six-second durations, each phase of demolition would include up to 450 seconds (7.5 minutes) of blasting over a 3 to 3.5 month period of time (Phase 1 and Phase 2, respectively).

6.2.3 Advantages/Disadvantages

Construction of an earthen dike to isolate the demolition work provides the primary advantage that all demolition work would be conducted out of water. This allows the demolition subcontractor the ability to work during all tidal stages and provides a buffer zone of approximately 300 feet between demolition work and the marine waters. In addition, using the blasting component would reduce the duration of the demolition by an estimated 720 hours over Phases 1 and 2 combined as compared to Option 1.

The disadvantages of this option include:

- A change in the demolition schedule.
- Restrictions in the approach to the mass fill within the North and South Replacement areas that may increase construction costs.
- Limited data is available describing potential in-water impacts from near-water explosive demolition and that could lead to the need for collection of additional data.
- Demolition in the winter entails working in the extreme cold and construction is less efficient.

6.2.4 Impacts to Marine Mammals

The primary risks to marine mammals with Option 2 include physical harm from in-water placement of fill, sound/vibration transmission during filling operations associated with dike building, and the potential for in-water impacts from near-water use of explosives. Mitigation measures to prevent physical harm or adverse impacts from in-water fill placement have already been considered for the USACE 404/10 and IHA permits for the construction of the new dock

and mitigation measures have been developed and implemented. Constructing the dike is simply a re-sequencing of part of the already permitted Project activities.

Because blasting of the concrete deck structure would be set back inland out of water by 300 feet, in-water noise impacts are expected to be minimal because there is no direct pathway to the water. In addition, the granular fill dike would likely deflect the pressure wave from blast away from the water, further reducing the potential for in-water impacts.

ICRC conducted a review of available literature on noise associated with mechanical or out-of-water blasting demolition and determined that data are extremely limited. ICRC also contacted James Reyff, Senior Acoustician of Illingworth & Rodkin, Inc. and he confirmed this general lack of information on this topic (Reyff 2008).

However, one published study was located regarding potential in-water sound transmission resulting from out-of-water blasting. In 2004, the California Department of Transportation (Caltrans) contracted Illingworth and Rodkin, Inc. to perform measurements of underwater sound pressure levels during out-of-water controlled blasting operations as part of the construction of bridge pier footings on Yerba Buena Island for the San Francisco – Oakland Bay Bridge, East Span Seismic Safety Project (Caltrans 2004). The purpose of the measurements was to quantify peak and root-mean-square (RMS) underwater sound pressure levels for use in identifying impacts and to establish safety zones for marine mammals and fish. In-water sound pressure levels were measured during out-of-water blasts for two different piers. Pier W2E was on average, 80 meters (m) from shore and Pier W2W was on average, 30 m from shore. Worst case measurements were identified. Pier W2W was the closest to the water and thus had the highest in-water measurements and therefore is discussed below.

> *At Pier W2W, underwater sound pressure levels were measured during six out-of-water blasting events from the closest pier location to the shoreline (15 m) at elevations ranging from 0.5 and 13.5 m above mean sea level. Sound pressure measurements were collected at various positions or locations from the shoreline during each blast. The "worst" position measuring the greatest sound pressures was determined to be 10 to 20 meters (33-66 feet) from the shoreline. Peak pressures at this location ranged from 189 to 212 decibels (dB) and RMS levels based on a 35 msec time constant (RMS_{35msec}) ranged from 177 to 198 dB. Data indicated that pressures dropped off considerably with distance. Data from blasting events at both piers indicated that underwater sound pressure levels appeared to increase as blasting was conducted at lower elevations; i.e. putting the blast closer to the water. After close coordination between Caltrans and NOAA/NMFS, a marine mammal safety zone of 50 m was established.*

At the Port of Anchorage, demolition of the reinforced concrete deck structure by the use of blasting provides a unique option as the blasting would occur above ground and removed from marine waters by 300 feet (91.4 m) rather than immediately adjacent to marine waters as in the Caltrans project. Therefore, it is unlikely that sound pressures for out-of-water blasting at this distance would result in exceeding the Level A harassment (180 dB) threshold. Sound pressures may also be transmitted through the steel support piles to the ground below, but the setback distance of 300 feet would result in attenuation of sound levels to below the Level A or Level B thresholds. With the implementation of the mitigation measures discussed in detail in Section 7.0, the potential for blasting activities to result in adverse effects to marine mammals is considered minimal to negligible under Option 2.

Details of the proposed mitigation for Option 2 are provided in Section 7.0.

6.3 OPTION 3 – CONSTRUCT GRANULAR FILL DIKE AND DEMOLITION BY MECHANICAL MEANS ONLY

This section provides the Option 3 description of work, work durations, the advantages and disadvantages, and impacts to marine mammals.

6.3.1 Description of Work

Option 3 is similar to Option 2, except that blasting would not be a means used for demolition. Option 3 is comprised of two parts: 1) construct a dike around the existing dock in the summer; and 2) demolish the dock in the winter. Dike construction for Option 3 would follow the same process described in Option 2 above.

The construction of granular fill dike along the outer limits of the proposed Port expansion area would isolate the existing dock from marine waters allowing demolition to be accomplished out-of-water. This method would require the construction of approximately 2,600 LF of granular fill dike prior to Phase 1 demolition and approximately 2,300 LF prior to Phase 2. The dike would be constructed to an elevation above the highest anticipated tide elevation and would be approximately 100 feet wide at the top with approximately 2:1 side slopes. The dike would be constructed of clean granular fill placed by off-road dump trucks and bulldozers and compacted with vibratory rollers, similar to fill activities currently under way. After completion of the dike the contained water would be removed to a depth sufficient to access the limits of the demolition area from below. The proposed dike would be constructed in accordance with current permit conditions with regard to fish protection and provide fish escapement and/or rescue and release from entrapment.

Additional fill may be placed over the exposed sea floor to accommodate access and maneuvering of heavy equipment for final demolition and removal of debris. Summer construction of the dike would be necessary for proper fill placement and compaction and is anticipated to take approximately five months. After dike completion, the dock would be set back approximately 300 feet inland from the new shoreline. Figure 6-2 shows the location of the dikes for Phases 1 and 2 and the existing dock.

Following construction of the required dike for each phase of demolition, the applicable concrete structure would be demolished using mechanical means only as summarized in Option 1. For Option 3, Phase 1 dike construction would begin in the spring to early summer 2011 with Phase 2 dike construction scheduled to begin in spring or summer 2012. The first phase of demolition would take place during the winter of 2011/2012 and the second phase would take place during the winter of 2012/2013.

6.3.2 Work Durations

Phase 1 dike construction is anticipated to take approximately 1,200 hours (six 10-hour days for 5 months). The duration of Phase 2 dike construction is anticipated to be similar.

Total demolition activities for Phase 1 are anticipated to continue for duration of approximately 960 hours (60 hours/week x 16 weeks). Demolition of Phase 2 structures is anticipated to take approximately 1,320 hours (60 hours/week x 22 weeks) hours. Concrete demolition activities and steel pile demolition would be conducted continuously throughout each day. Although it

would require that a portion of the concrete deck be demolished before steel pile demolition can begin it is assumed that both portions of work would be performed concurrently.

6.3.3 Advantages/Disadvantages

Construction of an earthen dike to isolate the demolition work provides the primary advantage that all demolition work would be conducted out of water. This allows the demolition subcontractor the ability to work during all tidal stages and provides a buffer zone of approximately 300 feet between demolition work and the marine waters.

Disadvantages include:

- A change in the demolition schedule.
- Restrictions in the approach to the mass fill within the North and South Replacement areas that may increase construction costs.
- The use of large and heavy equipment to demolish the deck while working from the deck itself imposes safety concerns inherent with elevated equipment during demolition and logistical challenges for equipment to access, maneuver, and disembark from the structure.
- Demolition in the winter entails working in the extreme cold and construction is less efficient.

6.3.4 Impacts to Marine Mammals

Potential adverse impacts to marine mammals under Option 3 would be considered negligible. Details of the proposed mitigation for Option 3 are provided in Section 7.0.

6.4 COMPARISON OF DEMOLITION DURATIONS AND CONSTRUCTION SCHEDULES

Table 6-1 shows the demolition durations for each of the options discussed. The construction of the granular fill dike has not been included in the table because it is not a demolition activity and the fill placement has already been addressed in the USACE 404/10 permit.

Table 6-1 Demolition Durations for Each Option and Phase

Activity	Option 1		Option 2		Option 3	
	Phase 1	**Phase 2**	**Phase 1**	**Phase 2**	**Phase 1**	**Phase 2**
Mechanical Demolition	960 hrs	1320 hrs	720 hrs	840 hrs	960 hrs	1320 hrs
Blasting	0	0	7.5 min	7.5 min	0	0
Total Over/In-Water Demolition	960 hrs	1320 hrs	7.5 min	7.5 min	0	0

Notes: hrs - hours min - minutes

Although not an in-water activity, the blasting duration was included in the total over- or in-water demolition summation for Table 6-1 because it is being considered a potential impact.

Table 6-2 summarizes the season and year for each phase of proposed demolition for each option.

Table 6-2 Season and Year for Phases of Demolition

Phase of Dock Demolition	Option 1 Mechanical Demolition Over/In-Water		Initial Part of Option 2 or 3 Construct Dike	Option 2 Mechanical & Blasting Demolition Out-of-Water	Option 3 Mechanical Demolition Out-of-Water
	1A[1]	1B[1]			
Phase 1 northern	Summer 2011	Winter 2010/2011	Summer 2011	Winter 2011/2012	Winter 2011/2012
Phase 2 southern	Summer 2012	Winter 2011/2012	Summer 2012	Winter 2012/2013	Winter 2012/2013

[1] = Either Option 1A **OR** Option 1B may be selected. This is a summer or winter demolition. Not all year round. Winter months are generally November through March and summer months are generally May through October.

7.0 PROPOSED MITIGATION MEASURES

Mitigation measures for the pile driving activities are described in Section 11.0 of the LOA. It is possible that pile driving may still be ongoing during part of the demolition work if Option 1 is selected and performed during the summer months. Simultaneous demolition and pile driving activities are not anticipated for Options 2 and 3 because demolition will only occur in the winter. Mitigation measures have already been stipulated for the pile driving and these will be implemented.

Two sources of noise are considered to potentially cause an adverse impact to marine mammals: 1) the use of a hydraulic hammer for mechanically chipping the concrete deck into pieces; and 2) blasting. The POA conducted two acoustic studies of pile driving noise to establish safety and harassment zones for marine mammals for pile driving. Demolition of the dock structures using Options 1, 2, and 3 presents different and less severe noise issues than the pile driving activities. However, as previously noted, acoustic data on over-water and in-water noise associated with demolition activities are currently lacking. Therefore, ICRC proposes to utilize the safety and harassment zones for currently authorized under the IHA for the demolition activities.

A conservative comparison may be made between the chipping hammer operation and a vibratory noise source. Comparison of equipment horsepower and application of the energy between the vibratory pile driving and a hydraulic chipping hammer, indicates that the chipping hammer may only generate less than 20 percent of the energy of the pile driver. In addition, the chipping hammer does not strike directly into the water column or sea floor. The POA's 2007 acoustic study (URS Corporation 2007) determined the estimated distances for 190 dB, 180 dB, 160 dB, and 120 dB isopleths from impact and vibratory pile driving. From this study, isopleth distances were determined at 10 m, 20 m, 350 m, and 800 m, respectively. Although the 2007 safety radii for 190 dB and 180 dB isopleths were within 20 m for both types of pile driving, NMFS established a conservative 200-m mandatory shut-down radius which would require the pile driving operations to shut down anytime a marine mammal enters this zone.

Therefore, because there are no acoustic data available on demolition activities to estimate distances to the appropriate thresholds, ICRC proposes to apply a 50 m safety zone for all in-water heavy machinery, a 200 m safety zone for over-water and in-water chipping demolition and blasting, and an 800 m harassment zone for over-water or in-water chipping demolition and blasting activities. Potential mitigation measures that may be employed for each of the demolition options are described below. All demolition related mitigation measures listed in this section apply only to over-water or in-water construction and out-of-water blasting.

The mitigation measures discussed in this section are designed to eliminate potential for injury and minimize harassment to marine mammals, particularly beluga whales. If the maximum authorized take is reached or exceeded for the year, any marine mammal entering into the harassment isopleths will trigger mandatory shut down.

7.1 ACOUSTIC DETERRENT USING SOFT START

A ‘‘soft start’’ technique is used at the beginning of each in-water work period to allow any marine mammal that may be in the immediate area to leave before the mechanical equipment reaches full energy. The soft start requires equipment operators to initiate noise from demolition tools (chipping hammers, crushers, etc.) for 15 seconds at reduced energy followed by a 1-minute waiting period. The procedure is repeated two additional times. If any marine mammal is sighted within the safety zone (200 m) prior to or during the soft start, the operator (or other authorized individual) delays chipping until the animal has moved outside the safety zone. Furthermore, if marine mammals are sighted within a Level B harassment zone (800 m) prior to initiating chipping with a hydraulic hammer, operations are delayed until the animals move outside the zones in order to avoid takes. Chipping demolition resumes only after a qualified observer determines that the marine mammal has moved outside the safety or harassment zone, or after 15 minutes have elapsed since the last sighting of the marine mammal within the safety zone.

7.2 PRE-BLAST MONITORING FOR ALL MARINE MAMMALS

Starting one-half hour prior to each out-of-water blasting event, construction marine mammal observers at the project site will systematically scan the Port and Knik Arm waters as far as the eye can see, by unaided eyed and high-powered binoculars, for sign of marine mammals. If marine mammals are observed, blasting will be suspended and will not resume until the animal has left the view area or has not been re-sighted for 15 minutes.

7.3 50 M SAFETY ZONE FOR HEAVY MACHINERY SHUT DOWNS

For in-water heavy-machinery operations including dike construction, in-water fill placement, crushing, shearing, marine vessel operation, and steel recovery, a safety zone of 50 m would be implemented. If a marine mammal comes within 50 m of the machinery, operations cease and vessels slow to a reduced speed while still maintaining control of the vessel and safe working conditions to avoid physical injury.

7.4 200 M SAFETY ZONE FOR ALL CHIPPING HAMMER AND OUT-OF-WATER BLASTING

In the absence of specific acoustic data for demolition, a conservative approach would be to apply a safety zone of 200 m for the chipping hammer activities over water or in water and for the blasting events.

7.5 SHUT DOWN FOR LARGE GROUPS

To reduce the chance of the POA reaching or exceeding authorized take and to minimize harassment to beluga whales, over-water chipping hammer and blasting operations shut down if a group of five or more beluga whales is sighted approaching the 800 m harassment zone.

7.6 SHUT DOWN FOR BELUGA WHALE CALVES

Beluga whale calves are likely more susceptible to loud anthropogenic noise than juveniles or adults. If a calf is sighted approaching a harassment zone, over-water or in-water demolition activity and blasting ceases and will not be resumed until the calf is confirmed to be out of the harassment zone (800 m) and on a path away from such zone. If a calf or the group with a calf is not re-sighted within 15 minutes, demolition may resume.

7.7 CONSTRUCTION WEATHER DELAYS

Adequate visibility is essential to beluga whale monitoring and determining take numbers. Over- or in-water construction is not conducted when weather conditions restrict clear, visible detection of all waters within and surrounding the applicable safety or harassment zones. Conditions that can impair whale observation and require in-water pile driving delays include, but are not limited to, fog and a rough sea state.

7.8 CONSTRUCTION MARINE MAMMAL OBSERVERS

A construction monitoring program is conducted at the Port at all times when over- or in-water demolition is taking place, and 30 minutes prior to commencement. All marine mammal sightings will be documented on NMFS-approved marine mammal sighting sheets. If a marine mammal is located within an applicable harassment zone while in-water chipping or blasting is taking place, it will be documented as a “take”.

7.8.1 Monitoring for Dual Operations

If over-water and in-water demolition will take place at the same time as pile driving, there will be construction marine mammal observers assigned to each operation. Each will be responsible for documenting all sightings associated with their respective activity.

7.9 SCIENTIFIC MARINE MAMMAL MONITORING

An independent land-based beluga whale monitoring team shall report on: 1) the frequency at which beluga whales are present in the Project footprint; 2) habitat use, behavior, and group composition near the Port area and correlate those data with construction activities; and 3) observed reactions of beluga whales in terms of behavior and movement during each sighting. These observers will monitor for beluga whales eight hours per day (over two tide cycles) for four days per week but scheduling may change. These observers work in collaboration with the

POA to immediately communicate any presence of beluga whales or other marine mammals in the area prior to or during over- or in-water demolition activities. The POA will keep this monitoring team informed of all schedules for that day (e.g., "beginning in-water demolition at 9 am for two hours") and any changes expected throughout the day.

Scientific monitoring will continue throughout the remaining construction years and for a year post-construction. For each construction season, the monitoring program will produce an updated work plan, submit monthly reports, and provide an annual report. The POA will continue consultation with NMFS to continuously improve the scientific monitoring program.

7.10 DEMOLITION OCCURS IN WINTER

Marine mammal use of Knik Arm is limited during the winter season. To limit the potential impact on marine mammals, demolition of the dock and pilings during the winter season is a measure that may be used.

7.11 TECHNOLOGY REVIEW FOR MORE EFFECTIVE TECHNIQUES AND TOOLS

The POA will work with demolition subcontractors and investigate other technologies to learn and test new sound-attenuation or minimization techniques applicable to the Knik Arm environment as technologies advance and new technologies or methods emerge. If promising technologies or methods become available and may be implemented, POA would request re-evaluation of the potential impacts to marine mammals and adjust numbers and mitigation requirements accordingly, and consider these measures for future requests for incidental take authorizations.

7.12 MITIGATION MEASURES PROPOSED FOR EACH ALTERNATIVE

Table 7-1 presents the three options and shows the seasons in which they may be performed and the mitigation measures that would be applied to each. The mitigation measures were described in greater detail above.

Table 7-1 Options and Proposed Mitigation for Each

DEMOLITION OPTIONS AND SEASON PERFORMED					
	Option 1 - Mechanical Demolition In-Water		**Initial Part of Option 2 or 3 Construct Dike**	**Option 2 Mechanical and Blasting Demolition Out-of-Water**	**Option 3 Mechanical Demolition Out-of-Water**
Applicable Mitigation	1A Summer Demo	1B Winter Demo	Summer Construction	Winter Demo	Winter Demo
1 - Soft Start	X	X			
2-Pre-blast monitor				X[1]	
3 - 50 m Shutdown	X	X	X		
4 - 200 m Shutdown	X	X		X[1]	
5 - 800 m, 5+ whales	X	X		X[1]	
6 - 800 m, calves	X	X		X[1]	
7 - Visibility	X	X	X		
8 - Construction Monitors	X	X	X		
9 - Scientific Monitors	X		X		
10 -Winter Work		X		X	X
11 -Technology Review	X	X	X	X	X

[1] – For out-of-water blasting only

Mitigation Number:

1. Soft-Start Demolition -15 second low energy start, 1-minute delay, repeat twice. Delay if any marine mammal is observed within the safety zone (50 m) or harassment zone (800 m) for chipping hammer.
2. Pre-blast monitoring for all marine mammals starting ½ hour prior to each event; as far as eye can see.
3. 50 m mandatory shut down of all in-water machinery other than chipping for all marine mammals.
4. 200 m mandatory shutdown for all chipping or blasting for all marine mammals.
5. Shut down if five or more whales are observed inside or approaching the 800 m harassment zone for chipping hammer or blasting.
6. Shut down if whale calves are observed approaching the 800 m harassment zone until calves confirmed out of zone and on path away or not re-sighted within 15 minutes.
7. Visibility Restrictions – No in-water construction or blasting if visibility is restricted and radii are not clearly visible.
8. Construction Marine Mammal Monitoring 30 minutes prior and during in-water activities.
9. Scientific Marine Mammal Monitoring for beluga whales.
10. Winter Construction.
11. Technology Review for More Effective Techniques and Tools.

7.13 ADDITIONAL MITIGATION MEASURES FOR DUAL SOUND SOURCES

Under Option 1 there is a possibility that pile driving may be ongoing at the same time as dock demolition. Therefore, the potential exists for dual in-water sound sources if Option 1 is selected to be performed in the summer. The intermittent nature of pile driving and the amount of time spent by each crew performing non-pile driving activities significantly reduces the potential for simultaneous sounds to occur; however, as the potential does exist, management and mitigation measures will be developed and implemented to avoid or reduce impacts related to simultaneous in-water sound sources.

For the majority of work to be completed, it is anticipated that pile driving activities will not be located in the vicinity of the in-water demolition activities. Separation of these different types of in-water construction activities will be at least 500 m.

Two mitigation alternatives are proposed:

1) While pile driving crews and in-water demolition crews are separated by significant distances (greater than 500 m), separate safety and harassment zones would be established, monitored, and managed for each sound source.

2) As the distance between the crews decreases, the potential would exist for sound from the sources to combine. At present, there has not been an opportunity to measure actual sound from pile driving and in-water demolition (chipping) simultaneously in close proximity. If these activities are less than 500 m apart, then the mitigation measures required for pile driving will take precedence for both operations.

8.0 SUMMARY

Demolition approaches for removal of the existing dock structures were reviewed with regard to technical feasibility, cost, and ability to minimize Level B takes of marine mammals in the Knik Arm. Three options have been presented with proposed mitigation measures for each. A preferred option was not selected because there is a need for flexibility in the construction bidding process and to facilitate integration of the demolition work into the other components of the Marine Terminal Redevelopment Project. The POA and Maritime Administration seek guidance during this LOA permitting process to develop the appropriate mitigation measures for each option. These will be utilized in the Project planning process.

9.0 REFERENCES

Caltrans 2004. Hydroacoustic Measurements During Blasting for Piers W2E and W2W on Yerba Buena Island, San Francisco – Oakland Bay Bridge East Span Seismic Safety Project, August – September 2003. Prepared for California Transit Authority by Illingworth & Rodkin, Inc. 2004.

LOA 2008. Rulemaking and Letters of Authorization Application for Construction Activities Associated with the Port of Anchorage Marine Terminal Redevelopment Project, July 15 2009-July 14, 2014. Submitted by the U.S. Maritime Administration and Port of Anchorage to the National Marine Fisheries Service in November 2008.

NMFS 2008. National Marine Fisheries Service (NMFS). Incidental Harassment Authorization (IHA) Permit for Construction Activities Associated with the Port of Anchorage Marine Terminal Redevelopment Project July 15, 2008 to July 14, 2009. Issued to the Port of Anchorage and the U.S. Department of Transportation Maritime Administration.

Reyff 2008. Personal communication with James Reyff, Illingworth & Rodkin, Inc. 29 December, 2008. Regarding available information on acoustic studies and data for demolition activities near marine waters.

URS Corporation 2007. Port of Anchorage Marine Terminal Development Project Underwater Noise Survey Test Pile Driving Program, Anchorage, Alaska. Report prepared for Integrated Concepts & Research Corporation, Anchorage, Alaska. 110 p.

USACE. 2007. Department of Army Permit. Port of Anchorage, Permittee. Permit No. POA-2003-502-N. Issued by the U.S. Army Engineer District, Alaska.

FIGURES

This page intentionally left blank.

Anchorage Port Expansion Team

PORT OF ANCHORAGE
We've got the goods.

ICRC

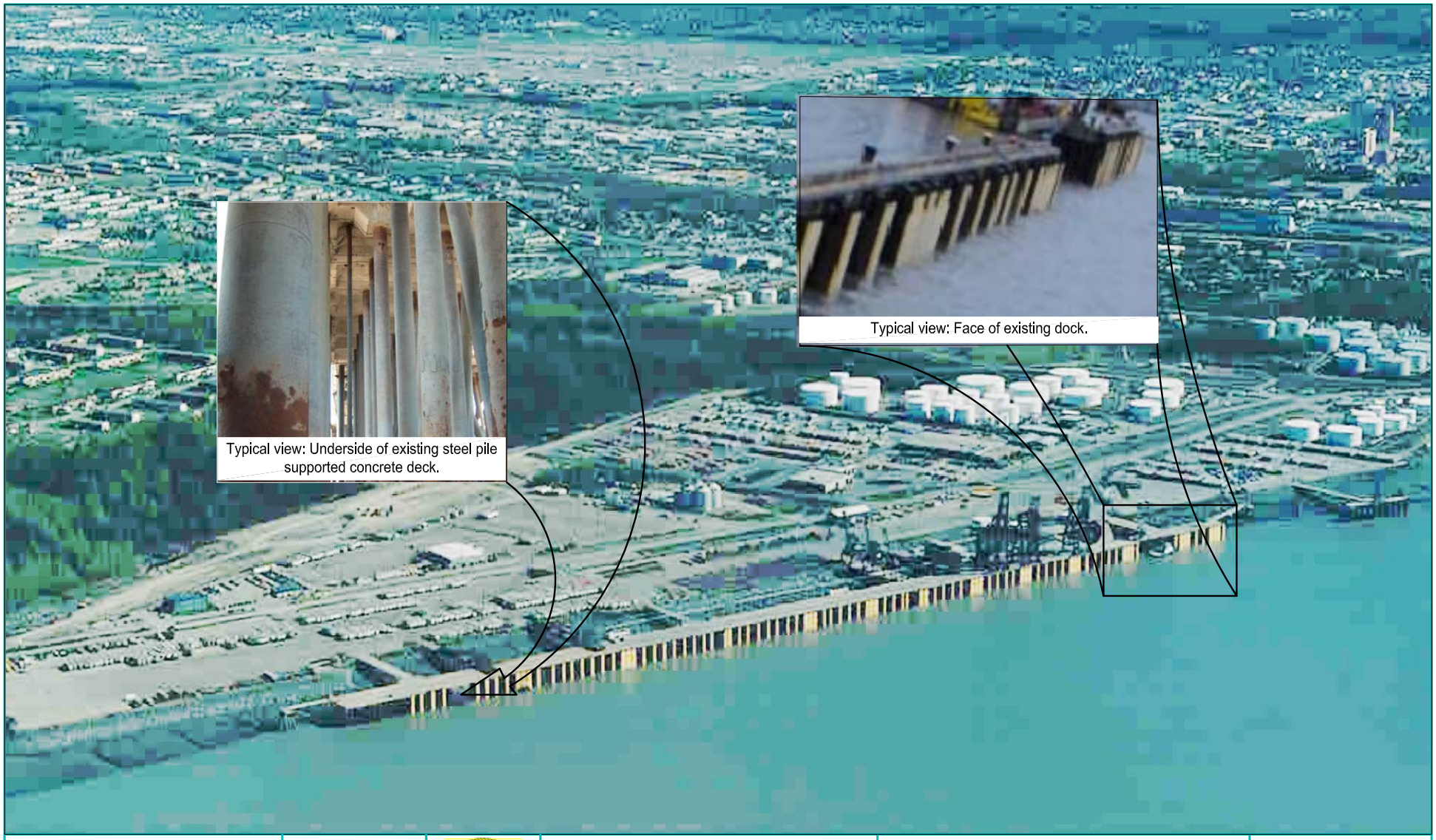
421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

Port of Anchorage Intermodal Expansion Project

Existing Dock, Plan View

Figure 1 - 1

01-02-09



Anchorage Port Expansion Team

PORT OF ANCHORAGE
We've got the goods.

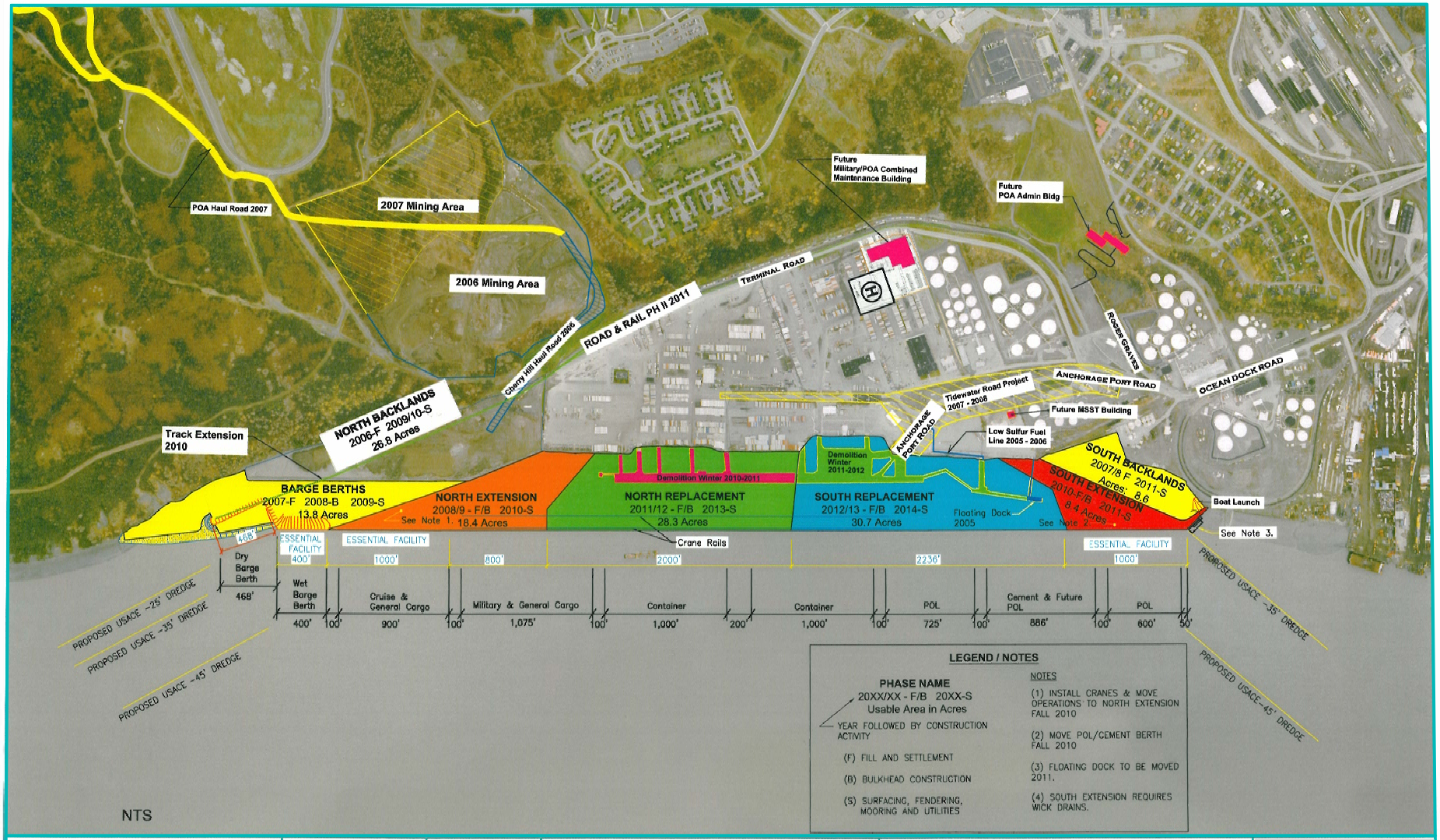
ICRC

421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

Port of Anchorage Intermodal Expansion Project

Existing Dock, Front View
Figure 5 - 1

01-02-09



Anchorage Port Expansion Team

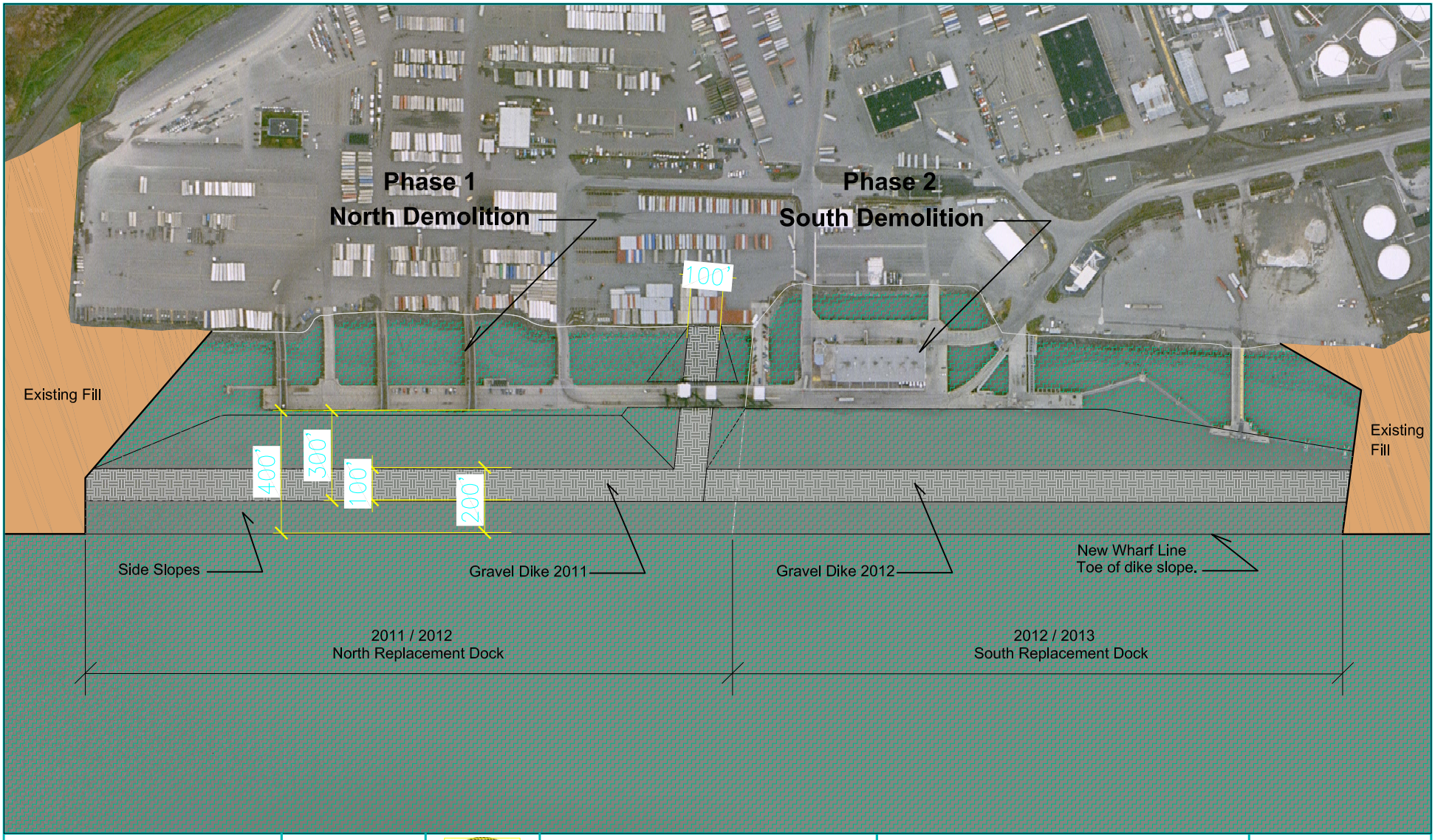
PORT OF ANCHORAGE
We've got the goods.

ICRC
421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

Port of Anchorage Intermodal Expansion Project

PHASING PLAN
FIGURE 6-1

05-21-08



Anchorage Port Expansion Team

PORT OF ANCHORAGE
We've got the goods.

ICRC

421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

Port of Anchorage Intermodal Expansion Project

Dikes, Options 2 & 3
Figure 6 - 2

01-02-09

APPENDIX A

Manufacturer Cut Sheets Showing Examples of Demolition Equipment and Tools

This page intentionally left blank.

Machines

» Articulated Trucks
» Backhoe Loaders
» Cold Planers
» Compact Track Loaders
» Compactors
» Feller Bunchers
» Forest Machines
» Forwarders
» Harvesters
» Hydraulic Excavators
› Mini Hydraulic Excavators
› Small Hydraulic Excavators
› Medium Hydraulic Excavators
› Large Hydraulic Excavators
› Ultra High Demolition Hydraulic Excavators
» Industrial Loaders
» Knuckleboom Loaders
» Material Handlers
» Motor Graders
» Multi Terrain Loaders
» Off-Highway Tractors
» Off-Highway Trucks
» Paving Equipment
» Pipelayers
» Road Reclaimers
» Scrapers
» Skid Steer Loaders
» Skidders
» Telehandlers
» Track Loaders
» Track-Type Tractors
» Underground Mining
» Wheel Dozers
» Wheel Excavators
» Wheel Loaders

Lift Trucks
Work Tools
Engines
Power Generation
Rental Power
Turbines
Parts
Used Equipment
Electronics
OEM Solutions
Technology
Gifts & Apparel

385C L HYDRAULIC EXCAVATOR

--- Select a Model ---

Overview | **Specifications** | **Benefits & Features** | **Standard / Optional Equipment** | **Work Tool Attachments**

OVERVIEW

385C L Hydraulic Excavator

The 385C L Series excavator has excellent control, high stick and bucket forces, impressive lift capacity, simplified service and a more comfortable operator station to increase your productivity and lower operating costs.

SPECIFICATIONS

	Units: **US** | **Metric**
Engine Model	Cat® C18 ACERT™
Net Flywheel Power	513 hp
Operating Weight	187360 lb

WORK TOOL ATTACHMENTS

360 Degree Rotation Shears

Excavator Rippers

Multi-Processor with Concrete Cutter Jaws

Multi-Processor with Crusher Jaws

BENEFITS & FEATURES

Engine

A combination of innovations working at the point of combustion, ACERT® Technology optimizes engine performance while meeting EPA Tier 3 emission regulations.
» Learn More

Hydraulics

Cat hydraulics deliver power and precise control to

385C L Hydraulic Excavator
» Download Product Brochure

Machines
» Articulated Trucks
» Backhoe Loaders
» Cold Planers
» Compact Track and Multi Terrain Loaders
» Compactors
» Feller Bunchers
» Forest Machines
» Forwarders
» Harvesters
» **Hydraulic Excavators**
» Industrial Loaders
» Knuckleboom Loaders
» Material Handlers
» Motor Graders
» Off-Highway Trucks
» Paving Equipment
» Pipelayers
» Road Reclaimers
» Scrapers
» Skid Steer Loaders
» Skidders
» Telehandlers
» Track Loaders
» Track-Type Tractors
» Underground Mining
» Wheel Dozers
» Wheel Excavators
» Wheel Loaders

385C L HYDRAULIC EXCAVATOR

--- Select a Model ---

Overview **Specifications** **Benefits & Features** **Standard/ Optional Equip.** **Attachments / Work Tools**

SPECIFICATIONS

Print Vers

Engine	Units: **US** | **Metric**
Engine Model	Cat® C18 ACERT™
Net Flywheel Power	513 hp
Net Power - ISO 9249	513 hp
Net Power - SAE J1349	513 hp
Net Power - EEC 80/1269	513 hp
Bore	5.71 in
Stroke	7.2 in
Displacement	1106 in3
Weights	
Operating Weight	187360 lb
Drive	
Maximum Travel Speed	2.8 mph
Maximum Drawbar Pull - Long Undercarriage	133090 lb
Hydraulic System	
Main System - Maximum Flow (Total)	259 gal/min
Swing System - Maximum Flow	119 gal/min
Maximum Pressure - Equipment - Normal	4640 psi
Maximum Pressure - Equipment - Heavy Lift	5080 psi
Maximum Pressure - Travel	5080 psi
Maximum Pressure - Swing	3770 psi
Pilot System - Maximum flow	24 gal/min
Pilot System- Maximum pressure	600 psi
Boom Cylinder - Bore	8.27 in
Boom Cylinder - Stroke	77.4 in
Stick Cylinder - Bore	8.66 in
Stick Cylinder - Stroke	89.1 in
HB Family Bucket Cylinder - Bore	7.87 in
HB Family Bucket Cylinder - Stroke	57.1 in
JB Family Bucket Cylinder - Bore	8.66 in
JB Family Bucket Cylinder - Stroke	62.4 in
Service Refill Capacities	
Fuel Tank Capacity	327.6 gal
Cooling System	26.7 gal
Engine Oil	17.2 gal
Swing Drive (each)	5 gal
Final Drive (each)	5.6 gal
Hydraulic System (including tank)	263 gal

385C L HYDRAULIC EXCAVATOR

Hydraulic Tank	214 gal

Sound Performance

Performance	ANSI/SAE J1166 OCT98

Standards

Brakes	SAE J1026 APR90
Cab/FOGS	SAE J1356 FEB88 ISO10262

Swing Mechanism

Swing Speed	6.5 RPM
Swing Torque	191914 lb ft

Track

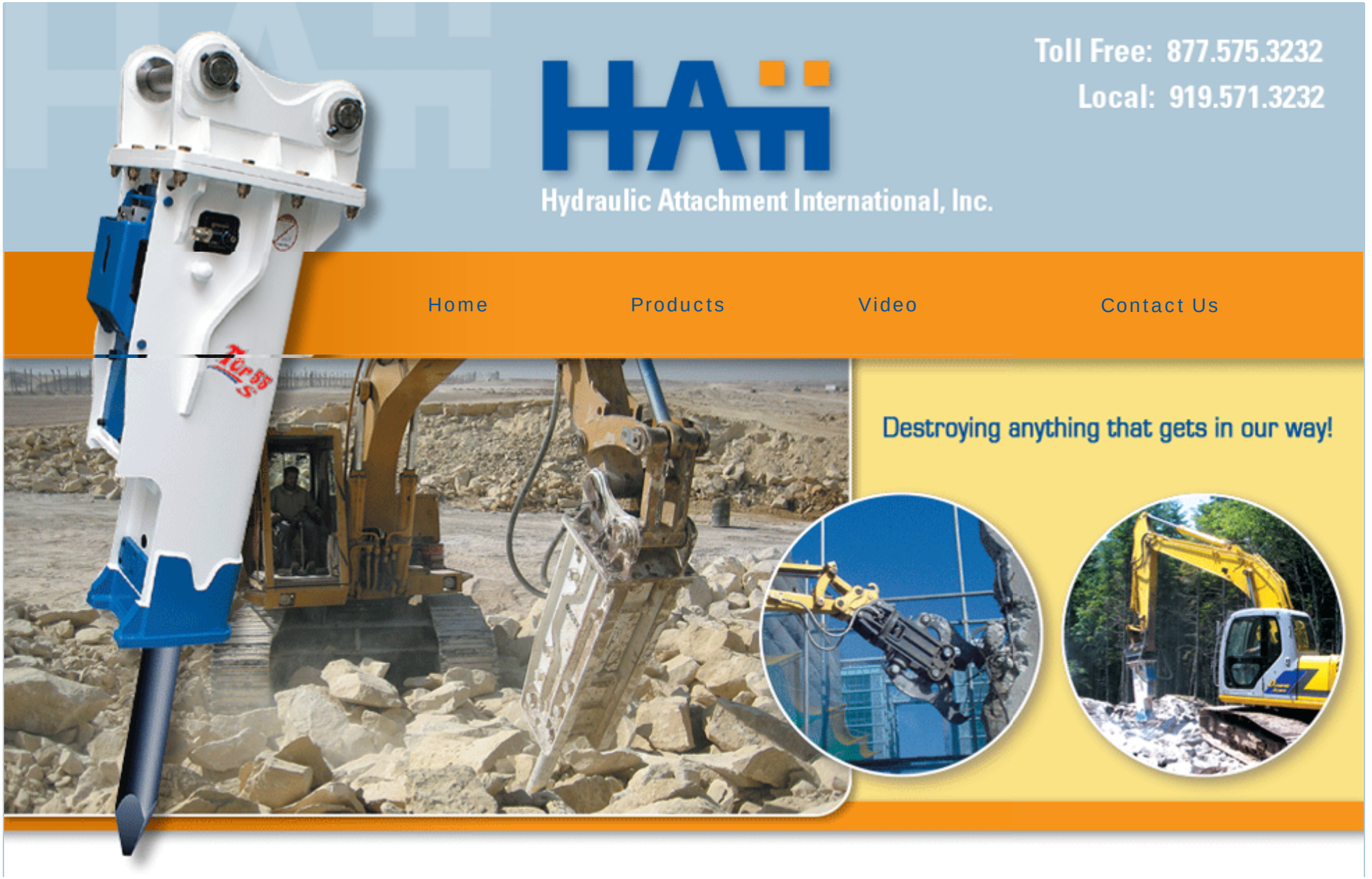
Standard w/Long Undercarriage	36 in
Optional for Long Undercarriage	30 in
Number of Shoes Each Side - Long Undercarriage	51
Number of Track Rollers Each Side - Long Undercarriage	9
Number of Carrier Rollers Each Side	3

Operating Specifications

Max Reach at Ground Level	56.4 ft
Max Digging Depth	38.6 ft
Bucket Digging Force	64530 lb
Stick Digging Force	55350 lb
Max Bucket Capacity	7.06 yd3
Nominal bucket weight	6795 lb
Bucket digging force - Normal	64530 lb

Dimensions

Transport width	151.2 in


Toll Free: 877.575.3232
Local: 919.571.3232
Hydraulic Attachment International, Inc.
Home
Products
Video
Contact Us
Destroying anything that gets in our way!

Hydraulic Hammers

Hydraulic Hammers - TOR 13 Series

Item/Model	Unit	TOR13S
Selection of Machine	lbs	19,842 - 35,274
*Operating Weight (Mount Cap+TOOL)	lbs	2,094.39
Weight of Main Body	lbs	1,014.13
Required Oil Flow Rate	gal/min	21.13 - 29.06
Setting Pressure (of Machine)	psi	2,828.16
Operating pressure (of Breaker/Hammer)	psi	2,175.51 - 2,465.57
Impact Rate	bpm	500 ~ 950
Rod/Chisel Dia	inch	4.02
Length	inch	39.37
Impact Energy - General	ft.lb	2,599

Hydraulic Hammers - TOR 18 Series

Item/Model		Unit	TOR18S
Selection of Machine		lbs	37,479 - 50,706
*Operating Weight (Mount Cap+TOOL)		lbs	2,756
Weight of Main Body		lbs	1,367
Required Oil Flow Rate		gal/min	23.8 - 33.0
Setting Pressure (of Machine)		psi	2,900.68
Operating pressure (of Breaker/Hammer)		psi	2,320.54 - 2,610.61
Impact Rate		bpm	360 - 700
Rod/Chisel	Dia	inch	4.25
	Length	inch	43.31
Impact Energy - General		ft.lb	3,500

Hydraulic Hammers - TOR 23 Series

Item/Model		Unit	TOR23S
Selection of Machine		lbs	39,683 - 57,320
*Operating Weight (Mount Cap+TOOL)		lbs	3,417
Weight of Main Body		lbs	1,565
Required Oil Flow Rate		gal/min	33.0 - 39.6
Setting Pressure (of Machine)		psi	3,045.71
Operating pressure (of Breaker/Hammer)		psi	2,320.54 - 2,610.61
Impact Rate		bpm	400 - 800
Rod/Chisel	Dia	inch	5.31
	Length	inch	47.24
Impact Energy - General		ft.lb	4,000

Hydraulic Hammers - TOR 36 Series

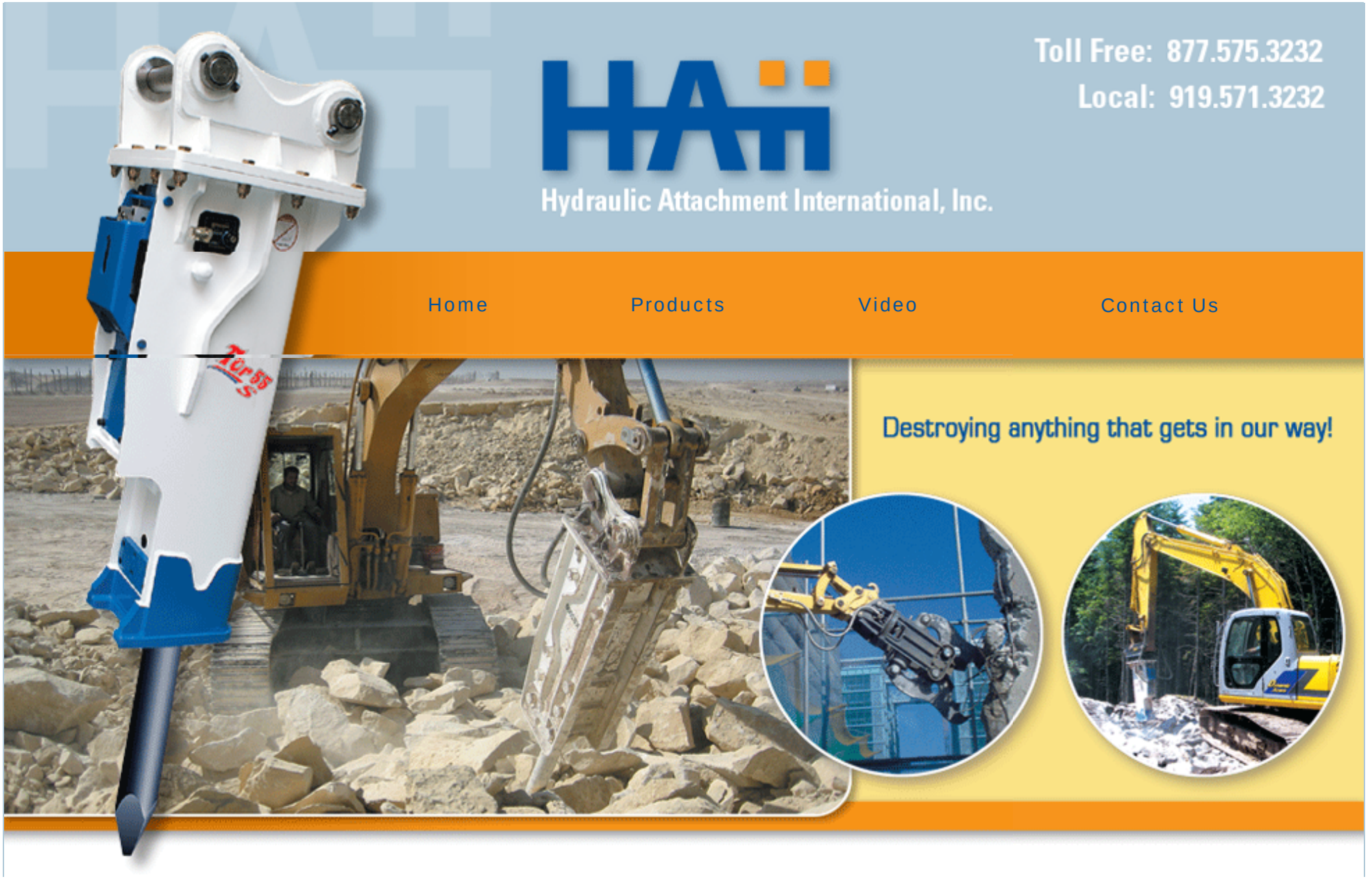
Item/Model		Unit	TOR36S
Selection of Machine		lbs	59,525 - 77,162
*Operating Weight (Mount Cap+TOOL)		lbs	4,740
Weight of Main Body		lbs	2,028
Required Oil Flow Rate		gal/min	42.3 - 50.2
Setting Pressure (of Machine)		psi	3,335.78
Operating pressure (of Breaker/Hammer)		psi	2,320.54 - 2,610.61
Impact Rate		bpm	360 - 700
Rod/Chisel	Dia	inch	5.71
	Length	inch	51.18
Impact Energy - General		ft.lb	5,500

Hydraulic Hammers - TOR 42 Series

Item/Model		Unit	TOR42S
Selection of Machine		lbs	74,957 - 103,617
*Operating Weight (Mount Cap+TOOL)		lbs	7,077
Weight of Main Body		lbs	2,920
Required Oil Flow Rate		gal/min	50.2 - 66.0
Setting Pressure (of Machine)		psi	3,480.81
Operating pressure (of Breaker/Hammer)		psi	2,320.54 - 2,610.61
Impact Rate		bpm	240 - 500
Rod/Chisel	Dia	inch	6.10
	Length	inch	59.06
Impact Energy - General		ft.lb	8,000

Hydraulic Hammers - TOR 55 Series

Item/Model		Unit	TOR55S
Selection of Machine		lbs	103,617 - 154,324
*Operating Weight (Mount Cap+TOOL)		lbs	9,149
Weight of Main Body		lbs	4,145
Required Oil Flow Rate		gal/min	55.5 - 81.9
Setting Pressure (of Machine)		psi	3,480.81
Operating pressure (of Breaker/Hammer)		psi	2,320.54 - 2,755.64
Impact Rate		bpm	210 - 450
Rod/Chisel	Dia	inch	6.89
	Length	inch	64.96
Impact Energy - General		ft.lb	11,000


Toll Free: 877.575.3232
Local: 919.571.3232
Hydraulic Attachment International, Inc.
Home
Products
Video
Contact Us
Destroying anything that gets in our way!

Hydraulic Crushers

TRIS 22

Features

Dual cylinders - Equipped with dual cylinders which provide jaw exchange.

Single main-pin - Easy and simple to detach and store.

Multi-use (3 Jaws for 1 body) - Multi shapes of the jaws in one body.

Enhanced durability - Declining tool breakdown and wearing with welded tool, benefit from fine steel.

Superior design - Single pin offers narrow grab width, enabling multi-purpose.

Handy maintenance - Designed for convenient maintenance by detaching jaw, which allows easy to enter.

Demolition

Features

Cutting steel structure and pieces based on the strong power with efficient performance.

Equipped the strongest level of cylinder to perform efficiency.

Highest stability and durability with light weight.

Item/Model		Unit	TRIS 22
Weight		lb	4,409
Overall Length		inch	88.98
Overall Width		inch	45.28
Opening Widthinch		15.75	
Max. jaw open width		inch	33.86
Cutter Length		inch	7.48
Cylinder		ea	2
Cutting Force		lbs	639
Oil Flow Rate		l/min	200
Operate Pressure		psi	4,641
Rotation	Oil flow	gal/min	10.0~23.8
	Operate Pressure	psi	15.4~38.5
	Rotation ratio	n/a	4.7 : 1
Hose	Main line	inch	1"ORFS#16
	Rotating line	inch	1/2"BSP
Suitable Excavator		ton	20~28

Item/Model		Unit	TRIS22DHR	TRIS30DHR
Weight		lb	4,409	5,798
Overall Length		inch	91.38	99.57
Overall Width		inch	53.31	47.76
Max Opening Width		inch	25.39	28.78
Cutter Length		inch	15.75	19.69
Cutting Force	A	ton	61	82
& Crushing Force	B	ton	172	134
	C	ton	256	229
Operating Pressure		psi	4,226	4,550
Oil Flow Rate		gpm	52.8~66.1	66.1~79.2
Suitable Excavator		ton	18~26	26~32
Speed-Up Valve		n/a	Option	Option
Motor Setting Pressure		psi	2,275	2,275
Motor Oil Flow Rate		gpm	9.5~10.5	9.5~10.5
Revolving Speed		rpm	13~15	13~15

Equipment
Used Equipment
Demolition Tools
Attachments
Manufacturers
Parts
Service
Supplies
Areas Served
Product Sitemap
Sign-up To Receive Specials via E-mail!

_____

Click for a Quote
Click to E-mail
Or Call:
1-800-407-5709

Specializing in:
Equipment Rentals to the Mid-Atlantic Region
Equipment Sales Nationwide

Download Product Literature

LaBounty Grapples - RDG Models

LaBounty Grapple Rentals / LaBounty Grapple Sales - Chesapeake carries a wide range of LaBounty Grapples for rent and LaBounty Grapples for sale. If you are looking for a LaBounty Grapple and you do not see it on our list, call us. Chances are we can locate the LaBounty Grapple you're looking for. Call 1-800-407-5709

LaBounty RDG Grapples are positive mount rotating grapples with synchronized jaws ideal for demolition and material handling applications where positive placement is required. A variety of jaw configurations are available to meet specific job applications. Standard jaw configuration consists of two tines bypassing into three tines.

360º Continuous Rotation. Each LaBounty RDG Grapple model features a 360º continuous rotation, severe duty turntable.

Built to Last. LaBounty RDG Grapples are manufactured using box tine construction using abrasion resistant, high strength alloy steel for minimal weight and maximum strength. Stick pins are hardened steel with heat treated bearings.

Standard Equipment. LaBounty RDG Grapples include integrated cylinder guards, severe duty turntable, mounting bracket and pins.

Hydraulic Requirements. Two hydraulic circuits are required, one for rotation and a second for the open and close function of the jaws.

LaBounty RDG Models Include:
RDG 40
RDG 60
RDG 90
RDG 120

Grapple SPECIFICATIONS

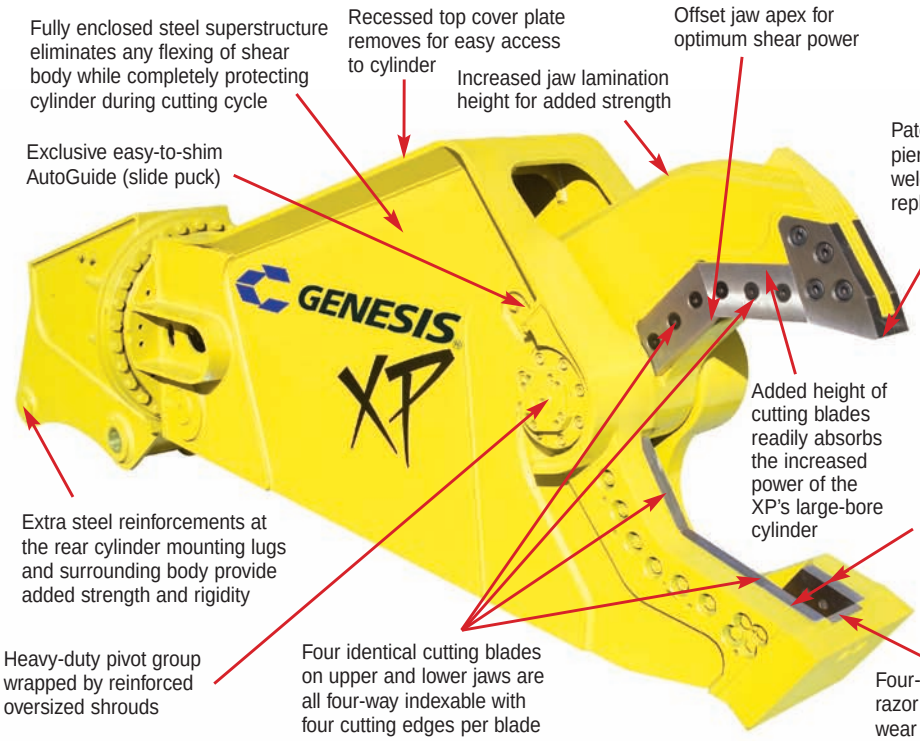
MODEL	GRAPPLE OPENING in./ mm	FULLY CLOSED in. / mm	UPPER JAW WIDTH in. / mm	LOWER JAW WIDTH in. / mm	WEIGHT lbs / kg	EXCAVATOR WEIGHT lbs / kg
GP MINI	34 / 864	2.3 / 58	4.5 / 114	14.5 / 368	185 / 84	4000-6000 / 1814-2722
GP 15	71 / 1803	8.5 / 216	15 / 381	27 / 686	690 / 313	15-25,000 / 7-11,340
HDR 30	88 / 2235	8 / 203	20.5 / 521	32.5 / 826	1540 / 699	25-35,000 / 11.4-15,876
HDR 40	95 / 2413	8 / 203	29.8 / 757	43.8 / 1113	2650 / 1202	35-46,000 / 15.9-20,866
HDR 50	113 / 2870	10 / 254	30 / 762	44 / 1118	3500 / 1588	46-65,000 / 20.9-29,484
HDR 70	116 / 2946	10 / 254	32 / 813	48 / 1219	5700 / 2586	65-88,000 / 29.5-39,917
HDR 100	142 / 3607	14.5 / 368	34 / 864	52 / 1321	7700 / 3493	88-111,000 / 40-50,350
HDR 170	150 / 3810	16 / 406	39 / 991	58 / 1473	8700 / 3955	111-180,000 / 50.4-81,648
HDR 200	150 / 3810	16 / 406	39 / 991	58 / 1473	11200 / 5091	180-240,000 / 82-10,900
TW 100	88 / 2235	8 / 203	32.5 / 826	42 / 1067	1600 / 726	25-35,000 / 11.4-15,876
TW 110	95 / 2413	8 / 203	42 / 1067	54.3 / 1380	2750 / 1247	35-46,000 / 15.9-20,866
TW 120	113 / 2870	10 / 254	42 / 1067	54.5 / 1379	3550 / 1610	46-65,000 / 20.9-29,484
TW 140	116 / 2946	10 / 254	46 / 1168	59.5 / 1511	4800 / 2177	65-88,000 / 29.5-39,917
TW 160	142 / 3607	14.5 / 368	50 / 1270	64.5 / 1638	5800 / 2631	88-111,000 / 40-50,350
TW 170	150 / 3810	16 / 406	65 / 1651	84 / 2134	7800 / 3538	111-180,000 / 50.4-81,648
RGS 191	92 / 2337	18 / 457	20.5 / 521	32.5 / 826	2950 / 1338	50-75,000 / 22.7-34,020
RGS 192	105 / 2667	27.5 / 699	30 / 762	44 / 1118	6350 / 2880	75-110,000 / 34-49,896
RGS 193	128 / 3251	20 / 508	34 / 864	52 / 1321	8400 / 3810	110-160,000 / 49.9-72,576
RDG 60	92 / 2337	16 / 406	20.5 / 521	32.5 / 826	3500 / 1584	38-70,000 / 17.2-31,752
RDG 90	105 / 2667	27.5 / 699	30 / 762	44 / 1118	6900 / 3122	70-120,000 / 31.8-54,432
RDG 120	128 / 3251	20 / 508	34 / 864	52 / 1321	9950 / 4480	120-160,000 / 54.4-72,576

GENESIS®

XP Mobile Shears (GXP)

GENESIS®

PALADIN
DEMOLITION AND RECYCLING



APPLICATIONS

- **Scrap Processing**
- **Demolition**

REGENERATION VALVE

Proprietary hydraulic regeneration (speed) valve delivers fastest cycle times. More speed guarantees more production!

Model Number	Shear Weight	Jaw Opening	Jaw Depth	Shear Force at 5000 psi	Shear Force at 5500 psi	Typical Reach	Minimum Excavator Wt.	Minimum Excavator Wt.
	(lbs.)	(ins.)	(ins.)	(tons)	(tons)	(ft. - ins.)	boom mounted (lbs.)	stick mounted (lbs.)
* GXP 200	5,000	18	17	609	670	5' - 10"	25,000	40,000
* GXP 200R	6,200	18	17	609	670	8' - 9"	30,000	45,000
* GXP 300	7,200	23	24	800	880	7' - 0"	36,000	50,000
* GXP 300R	8,100	23	24	800	880	10' - 2"	45,000	68,000
GXP 400	8,800	28	29	980	1,078	8' - 0"	45,000	75,000
GXP 400R	12,000	28	29	980	1,078	11' - 7"	55,000	90,000
GXP 500	12,500	32	32	1,305	1,436	8' - 11"	55,000	98,000
GXP 500R	13,800	32	32	1,305	1,436	12' - 5"	67,000	110,000
** GXP 660 MAXX	13,700	32	32	1,475	1,625	10' - 0"	60,000	100,000
** GXP 660R MAXX	15,100	32	32	1,475	1,625	13' - 6"	75,000	112,000
GXP 700	13,800	35	35	1,460	1,606	10' - 0"	70,000	110,000
GXP 700R	17,000	35	35	1,460	1,606	13' - 10"	88,000	135,000
** GXP 990 MAXX	14,800	35	35	2,182	2,400	10' - 7"	88,000	135,000
** GXP 990R MAXX	18,000	35	35	2,182	2,400	15' - 0"	100,000	170,000
GXP 1000	15,800	38	38	1,750	1,925	10' - 9"	88,000	140,000
GXP 1000R	18,500	38	38	1,750	1,925	15' - 1"	100,000	170,000
GXP 1200	20,700	42	42	2,245	2,470	11' - 0"	110,000	170,000
GXP 1200R	26,300	42	42	2,245	2,470	15' - 11"	150,000	250,000
GXP 1500	23,700	44	44	2,590	2,849	11' - 6"	120,000	190,000
GXP 1500R	30,100	44	44	2,590	2,849	16' - 5"	160,000	250,000
GXP 2500	46,000	46	48	3,015	3,317	14' - 7"	200,000	280,000
GXP 2500R	54,000	46	48	3,015	3,317	21' - 9"	240,000	360,000

*GXP 200 and 300 series shears offer a single guide blade system.
**GXP MAXX models deliver extra shear power for heavy-duty processing.
Extended reach brackets are available on all non-rotating shears.

All Genesis XP "R" series shears feature continuous 360º rotation. Genesis XP shears are covered by a 12- month, 1,500-hour (whichever occurs first) warranty. Genesis reserves the right to continually make product improvements designed to positively enhance product performance.

1000 Genesis Dr., Superior, WI 54880 PH: 715-395-5252 FAX: 715-395-5255 www.genesisattachments.com

E-mail: info@genesisattachments.com

This page intentionally left blank.

APPENDIX B

Anchorage Municipal Charter Code and Regulations
Chapter 15.70 Noise Control

This page intentionally left blank.

Chapter 15.70 NOISE CONTROL

15.70.010 Short title of chapter.

This chapter may be known and cited as the Anchorage Noise Control Ordinance.

(GAAB 16.85.010; AO No. 78-48)

15.70.020 General provisions.

A. *Policy.* Whereas excessive sound and vibration are a serious hazard to public health and welfare and the quality of life, whereas a substantial body of science and technology exists by which excessive sound and vibration may be significantly abated, and whereas the people of the municipality have a right to an environment free from excessive sound and vibration that may jeopardize their health and welfare or degrade the quality of life, it is therefore the policy of the municipality to prevent excessive noise that may jeopardize the health or welfare of its citizens or degrade the quality of life.

B. *Exceptions.* The provisions of this chapter shall not apply to the emission of sound for the purpose of alerting persons to the existence of any emergency or the emission of sound in the performance of emergency work.

C. *Responsibility for violations involving motor vehicle.* It shall be a rebuttable presumption that the owner of a motor vehicle that violates or exceeds any provision of this chapter has caused or permitted the operation or driving of that motor vehicle.

D. *Sound level measurements.* It shall be unlawful for any person to operate or cause to be operated any source of sound in such a manner as to create a sound level that exceeds the equivalent sound level limits of specific decibel sound level limits set forth in this chapter when such equivalent sound level limits are measured at some other distance according to testing procedures established pursuant to section 15.70.040.B.1, except as otherwise required by federal law.

(GAAB 16.85.020; AO No. 78-48)

15.70.030 Definitions.

A. The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

A-weighted sound level means the sound pressure level in decibels as measured on a sound level meter using the A-weighting network, the level of which so read is designated dB(A) or dBA.

Commercial area means any parcel of land zoned as B-1, B-2A, B-2B, B-2C, B-3 or B-4 under title 21.

Construction means any site preparation, assembly, erection, substantial repair, alteration or similar action for or of public or private rights-of-way, structures, utilities or similar property, but excludes demolition.

Construction season means the period from April 1 through October 31, both dates inclusive, of each year.

Decibel (dB) means a unit measure of sound level.

Demolition means any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces or similar property.

Emergency work means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

Equivalent A-weighted sound level (Leq) means the constant sound level that in a given situation and time period conveys the same sound energy as the actual time-varying A-weighted sound.

Gross vehicle weight rating (GVWR) means the value specified by the manufacturer as the recommended maximum loaded weight of a single motor vehicle. In cases where trailers and tractors are separable the gross combination weight rating (GCWR), which is the value specified by the manufacturer as the recommended maximum loaded weight of the combination vehicle, shall be used.

Impulsive sound means sound of short duration, usually less than one second and of high intensity, with an abrupt onset and rapid decay, examples of which include explosions, drop forge impacts and the discharge of firearms.

Industrial area means any parcel of land zoned as I-1, I-2 or I-3 under title 21.

Motor carrier vehicle engaged in interstate commerce means any vehicle for which regulations apply pursuant to section 18 of the Federal Noise Control Act of 1972 pertaining to motor carriers engaged in interstate commerce.

Motor vehicle means every vehicle which is self-propelled and every vehicle which is propelled by electric power obtained from overhead trolley wires, but not operated upon rails as defined in section 9.04.010, and includes motorcycles or motor-driven cycles as defined in section 9.04.010.

Motorboat means any vessel that operates on water and is propelled by a motor, including but not limited to boats, barges, amphibious craft, water ski towing devices and hovercraft, but excluding vessels engaged in international commerce.

Motorcycle means an unenclosed motor vehicle having a saddle for the use of the operator and two or three wheels in contact with the ground, including but not limited to motor scooters and minibikes.

Muffler and *sound-dissipative device* mean a device for abating the sound of escaping gases of an internal combustion engine.

Noise means any sound that annoys or disturbs humans or causes or tends to cause an adverse psychological or physiological effect on humans.

Noise disturbance means any sound that endangers or injures the safety or health of humans or animals, annoys or disturbs a reasonable person of normal sensitivities, or endangers or injures personal or real property.

Noise-sensitive zone means any area designated pursuant to section 15.70.040.A.7 for the purpose of ensuring exceptional quiet.

Powered model vehicle means any self-propelled airborne, waterborne or landborne plane, vessel or vehicle that is not designed to carry persons, including but not limited to any model airplane, boat, car or rocket.

Public right-of-way means any street, avenue, boulevard, highway, sidewalk, alley, public use easement or similar place owned or controlled by a governmental entity.

Public space means any real property or structures thereon owned or controlled by a governmental entity.

Pure tone means any sound that can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this chapter a pure tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by five dB for center, frequencies of 500 Hz and above and by eight dB for center frequencies between 160 and in 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.

Real property boundary means an imaginary line along the ground surface and its vertical extension that separates the real property owned or leased by one person from that owned or leased by another person.

Residential area means any parcel of land zoned as R-1, R-1A, R-2A, R-2D, R-2M, R-3, R-4, R-5, R-6, R-7, R-8, R-9, R-O, D-2 or D-3, PLI, U or W under title 21, or any area of land used as single- or multiple-family dwellings, hospitals, nursing homes, homes for the aged, schools and similar institutions.

RMS sound pressure means the square root of the time averaged square of the sound pressure, denoted Prms.

Sound means an oscillation in pressure, particle displacement, particle velocity or other physical parameter in a medium with internal forces that causes compression and rarefaction of that medium. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

Sound level means the weighted sound pressure level obtained by the use of a sound level meter and frequency weighting network such as A, B or C as specified in American National Standards Institute specifications for sound level meters (ANSI S1.4-1971 or the latest approved revision thereof). If the frequency weighting employed is not indicated, the A weighting shall apply.

Sound level meter means an instrument that includes a microphone, amplifier, RMS detector, integrator or time averager, output meter and weighting networks used to measure sound pressure levels.

Sound pressure means the instantaneous difference between the actual pressure and the average or barometric pressure at a given point in space, as produced by sound energy.

Sound pressure level means 20 times the logarithm to the base 10 of the ratio of the RMS sound pressure to the reference pressure of 20 micropascals (20 micronewtons per square meter). The sound pressure level is denoted Lp or SPL and is expressed in decibels.

Vibration means an oscillatory motion of solid bodies of deterministic or random nature described by displacement, velocity or acceleration with respect to a given reference point.

Vibration perception threshold means the minimum ground- or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by direct means such as but not limited to sensation by touch or visual observation of moving objects.

Weekday means any day Monday through Friday that is not a legal state holiday.

B. All terminology used in this chapter and not defined in subsection A of this section or in chapter 15.05 shall be in conformance with applicable publications of the American National Standards Institute (ANSI) or its successor body.

(GAAB 16.85.030; AO No. 78-48; AO No. 85-18; AO No. 94-77(S), § 1, 5-31-94)

Cross reference(s)--Definitions and rules of construction generally, § 1.05.020.

15.70.040 Powers and duties of department of health and human services.

A. The noise control program established by this chapter shall be administered by the department of health and human services, which shall have in addition to any other authority vested in it the following powers:

1. The department may conduct or cause to be conducted research, monitoring and other studies related to sound and vibration.

2. The department may coordinate the noise and vibration control activities of all municipal departments, cooperate where practicable with all appropriate state and federal agencies and enter into contracts for the provision of technical services.

3. The department may request any other department or agency responsible for a proposed or final standard, regulation or similar action to consult on the advisability of revising the action if there is reason to believe that the action is not inconsistent with this chapter.

4. The department may review public and private projects subject to mandatory review or approval by other departments for compliance with this chapter if such projects are likely to cause sound or vibration in violation of this chapter.

5. The department and the police department may, except as otherwise prohibited by law, stop any motor vehicle, motorcycle or motorboat operated on a public right-of-way, public space or public waterway reasonably suspected of violating any provision of this chapter and issue a notice of violation or compliance order after the motor vehicle, motorcycle or motorboat is inspected or tested on-site as the department and the police department may require.

6. The department may develop and recommend to the assembly provisions regulating the use and operation of any product, including the description of maximum sound emission levels of such product; provisions prohibiting the sale of products that do not meet specified sound emission levels, if the sound level of the product is not regulated by the United States Environmental Protection Agency under section 6 of the Noise Control Act of 1972; and provisions identical to any regulations promulgated by the United States Environmental Protection Agency under section 6 of the Noise Control Act of 1972.

7. The department may prepare recommendations to be approved by the assembly for the designation of noise-sensitive zones containing noise-sensitive activities. Existing areas posted as quiet zones shall be considered noise-sensitive zones until otherwise designated.

B. In order to implement and enforce this chapter effectively, the department shall within a reasonable time carry out the following duties:

1. The department shall develop and promulgate standards, testing methods and procedures.

2. The department shall investigate and pursue possible violations of this chapter.

3. The department shall delegate functions, where appropriate, under this chapter to personnel within the department as deemed necessary by the director and to other municipal departments subject to the approval of the mayor.

4. The department shall study existing transportation systems within the community, such as truck routes, determine areas with sensitivity to sound and vibration caused by transportation,

recommend changes or modifications to the transportation systems to minimize the impact of sound and vibration on residential areas and noise-sensitive zones, and assist in or review the total transportation planning of the community, including planning for new roads and highways, bus routes, airports and other systems for public transportation to ensure that the impact of sound and vibration received adequate consideration.

5. The department shall make recommendations for modifications or amendments to this chapter to ensure consistency with all state and federal laws and regulations.

6. The department shall develop a generalized sound exposure map of the municipality, a long-term plan for achieving quiet in the municipality, and, subject to the approval of the assembly, integrate this plan into the planning process of the municipality.

7. The department shall administer noise program grants or other funds and gifts from public and private sources, including the state and federal governments.

8. The department shall evaluate and report to the mayor and assembly annually on the effectiveness of the municipal noise control program and make recommendations for any legislative or budgetary changes necessary to improve the program. The first such evaluation and report under this subsection shall be submitted to the assembly not later than July 15, 1979.

9. The department shall conduct programs of public education regarding the causes, effects and general methods of abatement and control of noise and vibration, the actions prohibited by this chapter and the procedures for reporting violations, and the participation of public interest groups in related public information efforts.

(AO No. 78-48; AO No. 85-8)

15.70.050 Governmental compliance.

A. All municipal departments and agencies shall to the fullest extent consistent with other law carry out their programs in such manner as to further the policy of this chapter.

B. All municipal departments and agencies shall cooperate with the department of health and human services to the fullest extent in enforcing this chapter.

C. All municipal departments and agencies shall comply with federal and state laws and regulations and the provisions and intent of this chapter respecting the control and abatement of noise to the same extent that any person is subject to such laws and regulations.

D. Any written contract, agreement, purchase order or other instrument whereby the municipality is committed to the expenditure of $5,000.00 or more in return for goods or services shall contain provisions requiring compliance with this chapter in a form approved by the municipal attorney.

E. The director shall recommend to the mayor and the assembly that the municipality procure and use in preference to any other product any product that the administrator of the United States

Environmental Protection Agency has certified as a low noise emission product pursuant to section 15 of the Noise Control Act of 1972 and determined suitable for use as a substitute; provided, however, that such certified product is reasonably available and has a procurement cost not more than 125 percent of the least expensive type of product for which it is certified as a substitute.

(AO No. 78-48; AO No. 85-8)

15.70.060 Prohibited acts and conditions.

A. No person shall unreasonably make, continue or cause to be made or continued any noise disturbance except noncommercial public speaking or public assembly activities conducted on any public space or public right-of-way.

B. The following acts and conditions and the causing thereof are declared to be in violation of this chapter:

1. *Aircraft and airport operations.* No person shall operate aircraft engines while the aircraft is on the ground or operate an airport facility in such a manner as to cause a noise disturbance across a residential real property boundary, on a public space or within a noise-sensitive zone. The department shall consult with the airport proprietor to recommend changes in airport operations to minimize any noise disturbance that the airport owner may have authority to control in its capacity as proprietor. Nothing in this section shall be construed to prohibit, restrict, penalize, enjoin or in any manner regulate the movement of aircraft that are in all respects conducted in accordance with or pursuant to applicable federal laws or regulations, including but not limited to takeoff, landing or overflight procedures.

2. *Animals.* No person shall own, possess or harbor any animal that frequently or for continued duration makes sounds common to its species in violation of the provisions of title 17, except for sounds created in a public zoo.

3. *Construction.* No person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work:

a. So that the sound therefrom creates a noise disturbance across a residential real property boundary or within a noise-sensitive zone between the hours of 10.00 p.m. and 6:00 a.m. during the construction season, between the hours of 10:00 p.m. and 7:00 a.m. during other months, or at any time on Sundays or state holidays;

b. So that the sound level therefrom exceeds an Leq of 80 dB(A) at or within a residential real property boundary or within a noise-sensitive zone during any one hour of the daily period from 6:00 a.m. to 10:00 p.m. during the construction season or from 7:00 a.m. to 10:00 p.m. during other months; or

c. So that the sound level therefrom exceeds an Leq of 80 dB(A) at or within a commercial or industrial real property boundary during any one hour of the daily period from 6:00 a.m. to 10:00 p.m. during the construction season or from 7:00 a.m. to 10:00 p.m. during other months.

The restrictions of subsection B.3 of this section do not apply to emergency work of public service utilities as provided in section 15.70.020.B, the use of domestic power tools as permitted in subsection B.4 of this section or construction work for which a permit has been issued pursuant to section 15.70.070.A.

4. *Domestic power tools.* No person shall operate or permit the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, snow blower or similar device used in residential areas between the hours of 10:00 p.m. and 7:00 a.m. the following day so as to cause a noise disturbance across a residential real property boundary.

5. *Emergency signaling devices.* No person shall intentionally sound or permit the sounding outdoors of any fire, burglar or civil defense alarm, siren, whistle or similar stationary emergency signaling device except for emergency purposes or for testing as provided in this subsection. Testing of a stationary emergency signaling device shall occur at the same time of day each time such a test is performed but not before 7:00 a.m or after 10:00 p.m. Any such testing shall only use the minimum cycle test time. In no case shall such test time exceed 60 seconds. Testing of the complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month or before 7:00 a.m. or after 10:00 p.m. unless otherwise specifically required by statute or ordinance. The 60-second time limit specified in this subsection shall not apply to such complete system testing. No person shall sound or permit the sound of any exterior burglar alarm or any motor vehicle burglar alarm unless such alarm is automatically terminated within ten minutes of activation.

6. *Explosives, firearms and similar devices.* No person shall use or fire explosives, firearms or similar devices that create impulsive sound so as to create a noise disturbance across a real property boundary or on a public right-of-way except as otherwise permitted by the terms of a permit issued to the owner or operator of a shooting range or user of explosives or similar devices pursuant to section 15.70.070.A. Such permit need not be obtained for licensed game-hunting activities on property where such activities are authorized by federal or state laws or for military personnel and components engaged in authorized military training exercises on federal property.

7. *Loading and unloading.* No person shall load, unload, open, close or otherwise handle boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 p.m. and 7:00 a.m. the following day in such a manner as to cause a noise disturbance across a residential real property boundary or within a noise-sensitive zone.

8. *Loudspeakers and public address systems.* No person shall use or operate for any commercial or noncommercial purpose any loudspeaker, public address system or similar device so that the sound therefrom creates a noise disturbance across a residential real property boundary or within a noise-sensitive zone.

9. *Operation of motorboats.* No person shall operate or permit the operation of any motorboat in any lake, river, stream or other waterway in such a manner as to exceed a sound level of 80 dB(A) at 50 feet (15 meters) or the nearest shoreline.

10. *Motor vehicle or motorboat repairs and testing.* No person shall repair, rebuild, modify, idle, run, accelerate or test any motor vehicle or any auxiliary equipment attached to such vehicle, motorboat or aircraft in such a manner as to cause a noise disturbance across a residential real property boundary or within a noise-sensitive zone.

11. *Noise-sensitive zones.* No person shall create or cause the creation of any sound within any noise-sensitive zone designated pursuant to section 15.70.040.A.7 so as to disrupt the activities normally conducted within the zone, provided that conspicuous signs are displayed indicating the presence of the zone. No person shall create or cause the creation of any sound within any noise-sensitive zone designated pursuant to section 15.70.040.A.7 containing a hospital, nursing home or similar activity so as to interfere with the functions of such activity or disturb or annoy the patients in the activity, provided that conspicuous signs are displayed indicating the presence of the zone.

12. *Places of public entertainment.* No person shall operate, play or permit the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier or similar device that produces, reproduces or amplifies sound in any place of public entertainment at a sound level greater than 90 dB(A) as read by the slow response on a sound level meter at any point that is normally occupied by a customer, unless a conspicuous and legible sign is located outside such place near each public entrance stating, "Warning: Sound Levels Within May Cause Permanent Hearing Impairment."

13. *Powered model vehicles.* No person shall operate or permit the operation of powered model vehicles so as to create a noise disturbance across a residential real property boundary, in a public space or within a noise-sensitive zone. Maximum sound levels for residential property or in a public space during the permitted period of operation shall conform to those set forth for residential land use in table 1 of section 15.70.080.A and shall be measured at a distance of 50 feet (15 meters) from any point on the path of the vehicle. Maximum sound levels for noise-sensitive zones during the permitted period of operation shall be governed by subsection B.11 of this section.

14. *Public service utilities.* No person shall operate or permit the operation of public service utility generation, transmission or distribution sites, facilities or substations thereof providing electrical power or natural gas in such a manner as to create a sound level that exceeds at or within a residential real property boundary or within a noise-sensitive zone an Leq of 65 dB(A) during any one hour of operation; provided, however, that such sites, facilities or substations were in use and operation on or before January 1, 1979.

15. *Radios, televisions, musical instruments and similar devices.* Except as otherwise permitted for noncommercial spoken language in subsection B.8 of this section, no person shall operate, play or permit the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier or similar device that produces, reproduces or amplifies sound:

a. Between the hours of 10:00 p.m. and 7:00 a.m. the following day in such a manner as to create a noise disturbance across a real property boundary or within a noise-sensitive zone, except for activities open to the public and for which a permit has been issued by the department as provided in section 15.70.070.A;

b. In such a manner as to create a noise disturbance at 50 feet (15 meters) from such device when operated in or on a boat on public waters; or

c. In such a manner as to create a noise disturbance to any person other than the operator of the device when operated on a common carrier by any passenger.

16. *Stationary nonemergency signaling devices.* No person shall sound or permit the sounding of any electronically amplified signal from any stationary siren, whistle or similar device intended primarily for nonemergency purposes from any place in such a manner as to create a noise disturbance across a residential real property boundary or within a noise-sensitive zone.

17. *Street sales.* No person shall offer for sale or sell anything by shouting or outcry within any residential or commercial area of the municipality except between the hours of 7:00 a.m. and 10:00 p.m.

18. *Tampering with noise control device or sound monitoring equipment.* No person shall remove or render inoperative for purposes other than maintenance, repair or replacement any noise control device or element of design or noise label of any product manufactured to meet specific noise emission limits under federal or state law. No person shall move or render inaccurate or inoperative any sound monitoring instrument or device positioned by or for the department when such device or the immediate area is clearly labeled in accordance with department regulations to warn of the potential illegality. No person shall use a product manufactured to meet specific noise emission limits under federal or state law that has had a noise control device or element of design or noise label removed or rendered inoperative with knowledge that such action has occurred.

19. *Vibration.* No person shall operate or cause the operation of any device that produces low-frequency, inaudible sound that creates vibration above the vibration perception threshold of any individual within a residential real property boundary or within a noise-sensitive zone between the hours of 10:00 p.m. and 7:00 a.m. the following day.

(GAAB 16.85; AO No. 78-48; AO No. 94-77(S), § 2, 5-31-94)

Cross reference(s)--Vehicles and traffic, tit. 9; business licenses and regulations, tit. 10; transportation, tit. 11; Port of Anchorage, ch. 11.50; municipal airports, ch. 11.60; animals, tit. 17; building regulations, ch. 23.05; streets and rights-of-way, tit. 24; utilities, tit. 26.

15.70.070 Noise permits.

A. *Generally.* The department shall have the authority consistent with this section to grant permits that may be requested pursuant to sections 15.70.060.B.3, pertaining to construction,

15.70.060.B.6, pertaining to explosives, firearms and similar devices, 15.70.060.B.15(a), pertaining to public events, 15.70.090.E, pertaining to snow removal equipment off public rights-of-way, and 15.70.090.G, pertaining to motor vehicle racing events.

B. *Application.* Any person seeking a noise permit shall file with the department an application containing information that demonstrates that bringing the source of sound or activity for which the permit or variance is sought into compliance with this chapter would constitute an unreasonable hardship on the applicant, the community or other persons. Any person seeking a noise permit shall file application with the director at least 20 days prior to the commencement of the noise for which the permit is requested. The director shall have authority to waive, consistent with administratively established criteria, the 20-day time requirement in order to expedite issuance of permits. Notice of an application for a permit shall be published within ten days from the date of application, and no permit may be issued without such notice prior to issuance; provided, however, that notice by publication shall not be required in order to issue a short-term permit having a duration of 21 consecutive calendar days or less unless the director determines that there is a substantial potential for impact on the public. Any individual who claims to be adversely affected by allowance of the permit may file a statement with the department containing any information to support his claim. Upon the written request of any affected person, the applicant or the director, an administrative hearing shall be held pursuant to chapter 3.60 to consider evidence relative to the criteria set forth in subsection C of this section.

C. *Criteria for approval.* In determining whether to grant or deny the application for a permit, the director or hearing officer shall balance the hardship on the applicant, the community and other persons of not granting the permit against the adverse impact on health, safety and welfare of persons affected, the adverse impact on property affected and any other adverse impacts of granting the permit. Applicants may be required to either measure or allow the department to measure the sound level of or the vibration from any source in accordance with the methods and procedures and at such locations and times as the department may reasonably prescribe, to furnish reports of the results of such measurements to the department and to require the measurements to be conducted in the presence of the department enforcement officers. Applicants for a permit and persons contesting a permit may be required to submit any other information the department may reasonably require. In granting or denying an application, the director shall keep on public file a copy of the decision and the reasons for denying or granting the permit. No permit shall be granted for any source of sound or activity that violates or would violate any provision of federal or state law or any provision of any other chapter of this title or this Code.

D. *Conditions.* Permits shall be granted by notice to the applicant containing all necessary conditions, including as part of any permit a time limit on the permitted activity. The permit shall not become effective until all conditions are agreed to by the applicant. Noncompliance with any condition of a permit shall terminate the permit and subject the person holding it to those provisions of this title regulating the source of sound for which the permit was granted.

E. *Extensions.* Application for extension of time limits specified in permits or for modification of other substantial conditions shall be treated like applications for initial permits under subsection C of this section.

F. *Duration.* No permit shall be granted pursuant to this section for an initial period longer than one year.

(GAAB 16.85; AO No. 78-48; AO No. 89-130)

15.70.080 Property line noise emission standards.

A. Except as otherwise provided in subsections B and C of this section, no person shall operate or cause to be operated on private property any source of sound in such a manner as to create a sound level that exceeds the limits set forth for the receiving land use category in table 1 when measured at or within the property boundary of the receiving land use.

TABLE 1. SOUND LEVELS BY RECEIVING LAND USE

Receiving Land Use Category	Time	Sound Level Limit (dB(A))
Residential area	7:00 a.m.--10:00 p.m. 10:00 p.m.-- 7:00 a.m.	60 50
Commercial area	7:00 a.m.--10:00 p.m. 10:00 p.m.-- 7:00 a.m.	70 60
Industrial area	At all times	80

B. No person shall operate or cause to be operated any source of sound in such a manner as to create a sound level measured at any location on a boundary between two receiving land use categories that exceeds the arithmetic mean of the respective sound level limits set forth for such receiving land use categories in table 1.

C. The provisions of subsections A and B of this section shall not apply to the unamplified human voice and activities covered by sections 15.70.060.B.1, pertaining to aircraft and airport operations, 15.70.060.B.3, pertaining to construction, 15.70.060.B.4, pertaining to domestic power tools, 15.70.060.B.5, pertaining to emergency signaling devices, 15.70.060.B.6, pertaining to explosives, firearms and similar devices, 15.70.060.B.9, pertaining to motorboats, 15.70.060.B.14, pertaining to public service utilities, 15.70.060.B.16, pertaining to stationary nonemergency signaling devices, 15.70.090.A, pertaining to motor vehicles operating on public rights-of-way, 15.70.090.D, pertaining to refuse collection vehicles, and 15.70.090.E, pertaining to snow removal vehicles on public rights-of-way.

(GAAB 16.85; AO No. 78-48)

Cross reference(s)--Supplementary zoning district regulations, ch. 21.45.

15.70.090 Motor vehicle noise emission standards.

A. No person shall operate or cause to be operated a motor vehicle or motorcycle on a public right-of-way at any time in such a manner that the sound level emitted by the motor vehicle or

motorcycle exceeds the level set forth in table 2 when measured at 50 feet or more or an equivalent sound level at some other convenient distance according to testing procedures established pursuant to section 15.70.040.B.1.

TABLE 2. MOTOR VEHICLE NOISE EMISSION STANDARDS

Vehicle Class	In Speed Zones 35 mph or Less (dB(A))	In Speed Zones Over 35 mph (dB(A))	Stationary Run-up (dB(A))
Motor vehicle of GVWR or GCWR of 10,000 pounds or more engaged in interstate commerce	86	90	88
All other motor vehicles of GVWRor GCWR of 10,000 pounds or more	86	90	--
Any motorcycle	76	80	--
Any other motor vehicle and any combination of vehicles towed by such motor vehicle	76	80	--

B. No person shall operate or cause or allow to be operated any motor vehicle or motorcycle not equipped with a muffler or other sound-dissipative device in good working order and in constant operation. No person shall remove or render inoperative or cause or allow to be removed or rendered inoperative other than for purposes of maintenance, repair or replacement any muffler or sound-dissipative device on a motor vehicle or motorcycle.

C. No person shall sound any horn or other auditory signaling device on or in any motor vehicle on any public right-of-way or public space, except as a warning of danger or as otherwise specifically required by federal or state law or title 9. No person shall sound any horn or other auditory signaling device that produces a sound level in excess of 90 dB(A) at 100 feet (30.5 meters).

D. No person shall on or after January 1, 1979, operate or permit the operation of the compacting mechanism of any motor vehicle that compacts refuse and creates during the compacting cycle a sound level in excess of 86 dB(A) at 50 feet (15 meters) or more from any point on the vehicle. Between the hours of 10:00 p.m. and 7:00 a.m. the following day, in a noise-sensitive zone, no person shall collect refuse with a refuse collection vehicle or operate or permit the operation of the compacting mechanism of a vehicle that compacts refuse. Between the hours of 10:00 p.m. and 7:00 a.m. the following day, no person shall collect refuse with a refuse collection vehicle or

operate or permit the operation of the compacting mechanism of a vehicle that compacts refuse in such a manner as to create a noise disturbance across a residential real property boundary.

E. No person shall operate or permit the operation of any motor vehicle operating for the purpose of removing snow if at any time the motor vehicle produces a sound level in excess of the level set forth in table 2 at a distance of 50 feet (15 meters) or more from any point on the vehicle. As provided in section 15.70.080.C, such motor vehicles are exempt from complying with the sound levels set forth in table 1 when operating on public rights-of-way. Such motor vehicles operating off a public right-of-way for the purpose of removing snow may be exempt from complying with the sound levels of table 1 when operating in compliance with the terms and conditions of a permit issued pursuant to section 15.70.070.A.

F. No person shall operate or permit the operation of any motor vehicle with a gross vehicle weight rating in excess of 10,000 pounds or any auxiliary equipment attached to such a vehicle for a period longer than ten minutes in any hour while the vehicle is stationary for reasons other than traffic congestion on private property or a public right-of-way or public space within 150 feet (46 meters) of a residential area or designated noise-sensitive zone between the hours of 10:00 p.m. and 7:00 a.m. the following day.

G. Except as permitted in section 15.70.070.A for motor vehicle racing events, no person shall operate or cause to be operated any recreational motorized vehicle off a public right-of-way in such a manner that the sound level emitted therefrom exceeds the limits set forth in table 3 at a distance of 50 feet (15 meters) or more from the path of the vehicle when operated on a public space or at or across the boundary of private property when operated on private property. This section shall apply to all recreational motorized vehicles, whether or not duly licensed and registered, including but not limited to commercial or noncommercial racing vehicles, motorcycles, go-carts, snowmobiles, amphibious craft, campers and dune buggies, but not including motorboats.

TABLE 3. RECREATIONAL VEHICLE NOISE EMISSION STANDARDS

Vehicle Type	Sound Level Limit dB(A)
Snowmobile	76
Motorcycle	76
Any other vehicle	76

(GAAB 16.85; AO No. 78-48)

Cross reference(s)--Vehicles and traffic, tit. 9; miscellaneous vehicle rules, ch. 9.36; transportation, tit. 11; vehicle inspection and maintenance program, ch. 15.80; supplementary district regulations, ch. 21.45.

15.70.095 Electronically amplified sound systems in motor vehicles.

A. *Prohibited noise.* Notwithstanding any other provisions of this Code, with the exception of this chapter, no person operating in or in control of a parked or moving motor vehicle shall operate or permit the operation of an electronically amplified sound system in or on the motor vehicle so as to produce sound that is clearly audible more than 50 feet (15 meters) from the motor vehicle or in violation of the provisions in section 15.70.060.

B. *Conflicting provisions.* If this section is determined to be in conflict with any other section of this Code, with the exception of this chapter, this section shall take precedence.

C. *Penalty.* Any person violating the provisions of this section shall pay a civil penalty of $100.00 for the first violation or date of violation, $300.00 for the second violation within six months of the first violation, and $1,000.00 and forfeiture of the sound system or components of the sound system up to $1,000.00 in value, for the third violation within one year of the first violation. The civil penalties for violations will be assessed through the administrative hearings officer as provided for in chapter 14.20.

D. *Enforcement.* Any authorized police officer shall issue a citation for any violation under this section, except they may arrest for instances when the alleged violator refuses to provide the officer with such person's name and address and any proof thereof as may be reasonably available to the alleged violator.

(AO No. 94-77(S), § 3, 5-31-94)

Cross reference(s)--Vehicles and traffic, tit. 9; business licenses and regulations, tit. 10; transportation, tit. 11; public nuisances, ch. 15.20; supplementary zoning district regulations, ch. 21.45; streets and rights-of-way, tit. 24.

15.70.100 Hazardous noise emission standards.

A. Except as otherwise provided in subsection B of this section, the director shall order an immediate halt to any sound that exposes, where such sound levels are received, any person to continuous sound levels in excess of those shown in table 4 or to impulsive sound levels in excess of those shown in table 5. As soon as reasonably possible following issuance of such an order, the municipal attorney shall apply to the Superior Court, Third Judicial District, or other court having jurisdiction, for an injunction to replace the order.

B. No order pursuant to subsection A of this section shall be issued if the only persons exposed to sound levels in excess of those listed in tables 4 and 5 are exposed as a result of trespass, invitation upon private property by the person causing or permitting the sound, or employment by a contractor or the person causing or permitting the sound. In determining continuous sound levels shown in table 4, equal energy time-intensity tradeoff shall be used if the sound level varies, and the energy equivalent over 24 hours shall be found.

TABLE 4. HAZARDOUS CONTINUOUS NOISE EMISSION LEVELS

Sound Level Limit dB(A)	Duration
90	24 hours
93	12 hours
96	6 hours
99	3 hours
102	1.5 hours
105	45 minutes
108	22 minutes

TABLE 5. HAZARDOUS IMPULSIVE NOISE EMISSION LEVELS

Sound Level Limit	Number of Impulses dB(A) per 24-hour Period
145	1
135	10
125	100

(GAAB 16.85; AO No. 78-48)
