

TORTOSA

OPERATIONS AND MAINTENANCE PLAN FOR CHANNEL NORTH OF HONEYCUTT ROAD BETWEEN HARTMAN ROAD AND MURPHY ROAD

CITY OF MARICOPA
PINAL COUNTY, ARIZONA

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APPROVED BY PINAL COUNTY	
_____	_____
Signature	Date

Print Name	

Title/Position	

TABLE OF CONTENTS

1	INTRODUCTION	3
	1.1 Purpose	3
2	OWNERSHIP	3
3	TORTOSA CHANNEL DESIGN	3
	3.1 Description.....	3
	3.2 Survey Monuments.....	4
	3.3 Soils Investigation.....	4
4	MAINTENANCE TOPICS	5
	4.1 Erosion Control and Local Drainage.....	5
	4.2 Benchmark and Grade Control	5
	4.3 Vegetation Maintenance and Control	5
	4.4 Rodent and Insect Control.....	5
	4.5 Maintenance of Fencing, Gates, and Signs.....	5
	4.6 Maintenance of Closure Devices	6
5	SUMMARY OF MAINTENANCE RESPONSIBILITIES.....	6
6	INSPECTIONS	6
	6.1 Annual Operational Inspections.....	6
	6.2 Major Storm Event.....	7
	6.3 Citizen Complaints and Inquiries	7
7	REPORTING	7
8	REFERENCES	7

Exhibit A – Tortosa Channel Grading and Drainage Plans

1 INTRODUCTION

1.1 Purpose

The purpose of this document is to serve as a guideline for the inspection and maintenance of the improved drainage channel adjacent to the Tortosa development, located within the City of Maricopa, Pinal County, Arizona, as more particularly described in the Tortosa CLOMR attached hereto as Exhibit A, as the same may be modified in connection with the approval by FEMA. The channel extends along the border of the Gila River Indian Community from the edge of Murphy Road to the edge of Hartman Road.

This Operations and Maintenance Plan establishes the formal procedures that will ensure the stability, height, and overall integrity of the channel and that its associated structures and systems will be maintained. This plan specifies the maintenance activities to be performed, the frequency of their performance, and the person, by name or title, responsible for their performance. The channel system must be maintained in accordance with this officially-adopted plan.

2 OWNERSHIP

The owner of the channel is the Tortosa Northeast Community Association (HOA). All maintenance activities will be the responsibility of the HOA. The channel is located within a proposed 100-foot wide drainage easement.

The City of Maricopa and Pinal County have ultimate responsibility for public safety, and for the maintenance of public rights-of-way. As a member of the National Flood Insurance Program (NFIP), the City of Maricopa (City) has assumed ultimate responsibility for the maintenance of the channel. The City will have the right to enter the limits of the channel and make repairs, should it be deemed necessary to protect the public or public facilities. Should the HOA default in the maintenance of the channel, as described herein, the City will assume responsibility for maintenance of the channel and shall draw funds from an HOA posted bond.

3 TORTOSA CHANNEL DESIGN

The construction of the channel is shown in detail on as-built design plans entitled "Tortosa – CLOMR, Channel Grading and Drainage Plans", prepared by Hoskin-Ryan Consultants, Inc., dated June 18, 2015 (Ref. 4).

3.1 Description

The channel extends from Sta 47+15 along Murphy Road and turns to the west at Sta 67+70 and continues from Sta 52+90 to Sta 1+40 (Sta 1+00 is the intersection of the channel line with Hartman Road). The channel has shotcrete sides and an earthen bottom between Sta 29+79 to Sta 51+00 and earthen sides and an earthen bottom for the rest of the channel. The channel sits in a 100-ft wide proposed drainage easement. The side slopes in the drainage easement shall not exceed 2H:1V along the shotcrete section of the channel and 4H:1V along the earthen sections of the channel. The channel is approximately 10-ft wide and flows to the north, along Murphy Road, with a 0.10% slope. After the channel turns west to run along the Gila River Indian Community border, the channel widens to 35-ft and the slope decreases to 0.08% to the west.

The channel has been designed to provide a minimum of one and one-half (1.5) feet of freeboard above the computed water surface elevations.

3.2 Survey Monuments

Refer to the channel as-built plans entitled "Tortosa – CLOMR, Channel Grading and Drainage Plan", prepared by Hoskin-Ryan Consultants, Inc., dated June 18, 2015 (Ref. 4). A NAVD 88 benchmark has been set at the west corner of Section 21 on North Hartman Road.

3.3 Soils Investigation

A soils investigation for the channel site prior to construction is documented in the *Geotechnical Engineering Report, Tortosa – Northeast Parcels, Honeycutt Road and Hartman Road, Pinal County, Arizona*, prepared by Ricker-Atkinson-McBee & Associates, Inc., dated April 19, 2005 (Ref. 2).

4 MAINTENANCE TOPICS

4.1 Erosion Control and Local Drainage

Three magnitudes of erosion may occur along the earthen embankment:

- a. Rilling, or small channels forming vertically along the channel, is caused by local runoff from the roadway and landscaping, and does not affect the function or integrity of the channel. In areas where the flow is more concentrated, placement of loose rock riprap may help to alleviate this situation.
- b. Areas where the geotextile fabric becomes exposed during smaller rainfall events may be an indication of continued expected erosion. Deposits of loose riprap may help to protect from further erosion. For the earthen portion of the channel a maximum of 4H:1V sideslope should be maintained along the north side of the channel, and a maximum of 4H:1V sideslope should be maintained on the south side of the channel.
- c. In the event of a large enough flood event, portions of the soil overburden could possibly be eroded, exposing the geotextile fabric. Repairs may take the form of replacement of the fill material, and re-vegetation. If the area is one of frequent damage, placement of large diameter rock riprap may be necessary to protect the fill and vegetation.

The shotcrete portion of the channel should be inspected for cracking or undermining of the shotcrete. Repairs may take the form of replacement of the damaged section of shotcrete or the addition of riprap to stop undermining of the shotcrete. For the shotcrete portion of the channel a maximum sideslope of 2H:1V should be maintained.

4.2 Benchmark and Grade Control

- a. As indicated on the as-built plans for the channel, a benchmark has been set at the west $\frac{1}{4}$ corner of Section 21, Township 4 South, Range 4 East, of the Gila and Salt River meridian. The rebar marker is located on North Hartman Road.
- b. An elevation survey should be conducted annually by a Registered Land Surveyor, contracted by the HOA. Spot elevations at the monuments located on the top of the channel should be compared to the as-built plan elevations.
- c. The areas of the channel between the monuments should be visually inspected on an annual basis for evidence of settling, and additional elevation survey shots should be taken at any such spots.
- d. The channel should be visually inspected on an annual basis for evidence of sediment buildup, and additional elevation survey shots should be taken at any such spots.

4.3 Vegetation Maintenance and Control

Growth of the vegetation, including roots into the embankment, will be encouraged along channel embankment. Vegetation should be maintained regularly to prevent slope destabilization. Periodic treatment with a pre-emergent herbicide should be used to control weed growth.

4.4 Rodent and Insect Control

Rodents and insects may affect the integrity or function of the channel. During the visual examination, signs of activity should be looked for. A pest control service should be contacted if necessary.

4.5 Maintenance of Fencing, Gates, and Signs

The channel is not fenced except at maintenance vehicle access points. These gates should remain locked by the HOA to prevent public use, and should be inspected to ensure they are not damaged by large flood events.

4.6 Maintenance of Closure Devices

In the event of a significant flooding event (100-year storm or greater), the HOA shall inspect the gates to ensure that they have been manually closed.

5 SUMMARY OF MAINTENANCE RESPONSIBILITIES

Activity to be Performed	Frequency	Responsible Party
Check Gate Closure	End of all Routine Maintenance	Checked by HOA
Stability check; visual inspection ⁽¹⁾	Annually	Professional Civil Engineer contracted by HOA
Height check; elevation survey ⁽²⁾	Annually	Professional Civil Engineer contracted by HOA / Registered Land Surveyor contracted by HOA
Overall integrity check; visual inspection	Annually	Professional Civil Engineer contracted by HOA
Geotextile fabric exposure check; visual inspection	Annually	Professional Civil Engineer contracted by HOA
Inspection report documenting channel condition and any required repairs	Annually	Professional Civil Engineer contracted by HOA
Geotextile fabric integrity check	Five-Year Intervals ⁽³⁾	Professional Civil Engineer contracted by HOA

(1) Should it be deemed necessary, the Professional Engineer conducting the visual inspection may request soils testing data.

(2) Take spot elevations at the monuments located on the top of the channel and compare with the as-built plans. Visually inspect the areas in-between monuments for any evidence of settling, and take additional shots at any such spots if needed.

(3) Or as recommended by manufacturer. Geotextile fabrics can have a lifespan of several decades, however exposure to UV radiation/sunlight can significantly decrease the expected lifespan. Exposed geotextile fabric should be re-covered with fill material overburden as soon as possible.

6 INSPECTIONS

It is responsibility of the HOA to provide inspections and maintenance. The City of Maricopa and Pinal County have the right to gain access to maintain the storm drain outlets and the channel if needed. If there are any questions arising from these inspections, a registered civil engineer should be consulted for advice. The HOA shall contract with a civil engineer registered in the State of Arizona for the inspection of the embankment, and a licensed contractor for any repairs. The following inspections shall be conducted by the HOA:

6.1 Annual Operational Inspections

- a. List any discrepancies.
- b. Review for action required.
- c. Schedule necessary repairs.

6.2 Major Storm Event

- a. Inspect project during or after a major storm event.
- b. Inspect project at first flood warning to ensure gate closures
- c. List any problems.
- d. Review for action required.
- e. Schedule necessary repairs.
- f. Record flood depth.

6.3 Citizen Complaints and Inquiries

- a. Investigate area of complaint.
- b. Respond to citizen within 48 hours.
- c. Take action if the problem lies within the Homeowners' Association responsibility, or refer to proper agency.

7 REPORTING

The HOA shall submit a written report to the City of Maricopa Floodplain Administrator, and the Pinal County Flood Control District detailing the results of the annual inspection including a list of any required repairs.

8 REFERENCES

1. Administrative Committee of the Federal Register, *Code of Federal Regulations: Title 44 Emergency Management and Assistance, Chapter I – Federal Emergency Management Agency, Department of Homeland Security, Part 65 – Identification and Mapping of Special Hazard Areas, Section 65.10 – Mapping of Areas Protected by Channel Systems, (44CFR65.10)*, October 1, 2003.
2. Ricker-Atkinson-McBee & Associates, Inc., *Geotechnical Engineering Report, Tortosa – Northeast Parcels, Honeycutt Road and Hartman Road, Pinal County, Arizona*, April 19, 2005.
3. Federal Emergency Management Agency, *Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix H: Guidance for Evaluating Flood Protection Systems*, February 2002.
4. Hoskin-Ryan Consultants, Inc., *Tortosa – CLOMR, Channel Grading and Drainage Plan*, June 18, 2015.

Exhibit A: Tortosa Channel
Grading and Drainage Plans