



City of Oakland Storm Damage Incidents 2023

Attachment A

Storm Damage Repair Schedules

1. Storm damage during incident period significantly increased the number of City projects
 - It will take time to complete all restoration work
 - Working on master schedule
2. Repair plan requires technical and engineering expertise in geotechnical, hydrological, and structural analysis
 - Working with consultant engineers to plan repairs and many sites damaged by the storm

Oakland Zoo Collapsed Roadway Entrance



Culvert collapsed under the Oakland Zoo roadway entrance at Golf Links Road during rain storm. Repairs completed.

Total Cost Estimate:
\$650,000

Completed: 100%

Priority: High



Completed Restoration 2/2/23

4525 Harbord Drive



- Damaged City storm pipe causing sinkhole in the basement of home

- CCTV shows multiple pipe fractures

Emergency repairs.

Total Cost Estimate: \$250,000

Completed: 0%

Priority: Urgent



A screenshot of a web application titled "Oakland Creeks and Watershed Program". The interface includes a search bar with "4525 HARBORD DR, OAKI" entered, a layer list on the left, and a map showing a network of pipes with various diameters (e.g., 0", 12", 14", 15", 30", 36") and colors (purple, blue, yellow). The map also shows street names like "GLAREWOOD LN" and "MANDALAY". The bottom of the screen displays coordinates and a scale bar.

Flood @ 4100 Redwood Rd



1/4/23 - South side of property City storm drain along residential homes, under parcel, and out to Redwood Rd.

-City 22" storm drain cracked (late December /early January rains): water shoots onto Redwood Rd and runs down neighboring parcels.

-Repair needed.

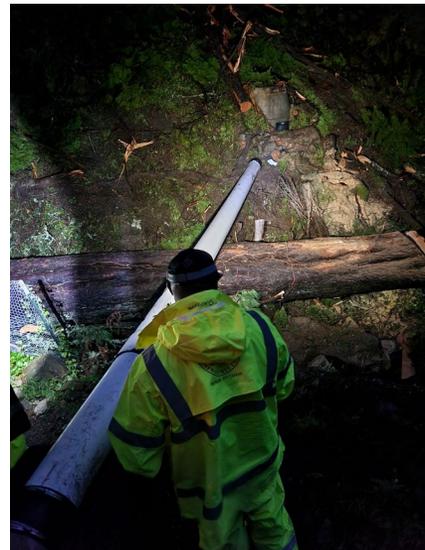
Total Cost Estimate: \$200,000

Completed: 0%

Priority: Urgent



15 Mall Ct. Landslide



Broken sewer line from fallen tree caused by landslide in severe winter storm.

Temporary repair completed by emergency contractor, flow is operational.

Permanent repair planning underway.

Work will be completed spring 2023.

Total Cost Estimate: \$200,000

Completed: 0%

Flooding at Chelsea & Longcroft Dr.

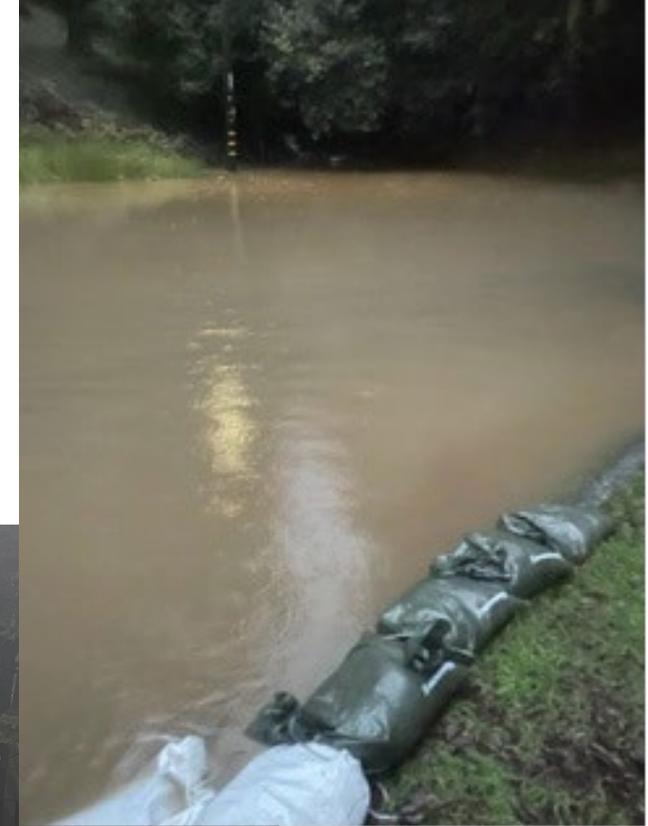


Sediment clogged City's storm drain pipe at Chelsea Dr. and caused major flood of intersection and property below at 6470 Longcroft Drive.

New storm drainage inlet needed to prevent sediment clogs and flooding.

Total Cost Estimate: \$120,000

Completed: 0%



Collapsed Storm Drain 769 Santa Ray Ave.



-1/6/23 rain caused erosion/sinkhole around storm drain along City easement on private property.

-Emergency repair needed to avoid foundation settlement. To prevent future sinkholes caused by heavy rainfall, the City repaired the entire 144-foot storm drain, a portion of which was damaged in FEMA 4683-DR-CA event at 769 Santa Ray.

Total Cost Estimate: \$65,000

Completed: 50%



13971 Skyline Blvd. and 7698 Surrey Lane Hill Erosion and Flooding

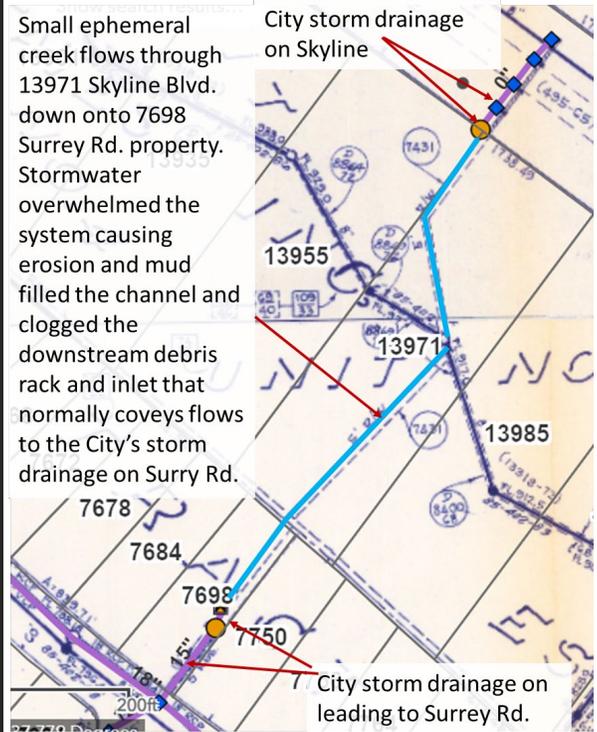
Incident period storms caused major hill erosion and landslide, covering City's storm drain system and creek with excessive mud.

Emergency work: remove mud and reestablish creek flow into City storm drainage.

Permanent Repair: improve storm drainage inlet located within easement on 7698 Surrey Lane to help prevent clogging caused by flooding/landslides in the future.

Total Cost Estimate: \$150,000 (tentative)

Complete: 40%



Dimond Park Erosion Stabilization and Restoration

Location: 3860 Hanly Rd.

Description: 12/31/22 - Sausal Creek flooded

- Damaged a repaired sinkhole that formed due to a retaining wall in poor condition.
- Entire length of poor condition retaining wall protects the park from the creek and should be removed and creek bank restored using biotechnical bank stabilization measures.

Total Cost Estimate: \$1,000,000

Completed: 0%



December 2021 storm undermined Sausal Creek retaining wall and eroded hole in Dimond Park lawn. Large hole repaired in fall 2022, repaid damaged by 12/31/22 storm.



Capacity of downstream culvert will continue to cause flooding of Dimond Park in large storms which are becoming more frequent due to climate change



12/31/22 flooding further damaged retaining wall.



Repair damaged by 12/31/22 creek flooding

Bay Forest Dr./ Tunnel Rd. Storm Drain Overflow/ Flooding

Three culverts clogged with sediment, displaced stormwater, caused major erosion to the hill, and flooded roadway and properties.

Emergency repairs complete

Long term fix remains

Total Cost Estimate: \$450,000

Completed: 30%



Landslide on Palos Colorado Trail, Joaquin Miller Park

Landslide onto trail resulting in trail closure and concerns for emergency vehicle access above.

Emergency repair and long term fix assessed.

Temporary emergency Repair Cost: \$10,000 (completed)

Permanent Repair Cost Estimate: \$100,000

Completed: 0%

Emergency vehicle access undermined on the trail above



6000 Shepherd Canyon Rd. Erosion and Flooding



Description: Landslide and major erosion caused sediment to enter roadway and clog nearby storm drains. This caused flooding in the area.

Emergency work: contractor cleaned up

Future project - Restore storm drain system

Total Cost Estimate: \$100,000 (tentative)

Completed: 40%



Merriewood Dr. Major Erosion and Landslide

Location: Between 5665 and 5671 Merriewood Dr.
Impacts to 5777 Grisborne Ave., 5801 Thornhill Dr.,
and possibly 5815 Thornhill Dr.

Description: Flooding caused storm drain overflow
resulting in major erosion and mudslide. Three
projects:

- 1. OPW - Emergency response – tarping/sandbags
and geotechnical engineer assessment
- 2. DOT - Repair erosion threatening Merriewood
Dr.
- 3. OPW - Repair hillside erosion within City
easement

Total Cost Estimate: \$200,000 (tentative)



Mudslide
caused
sediment to
flow onto
5777
Grisborne Ave
/5801
Thornhill Dr.



Chimes Creek Bank Erosion

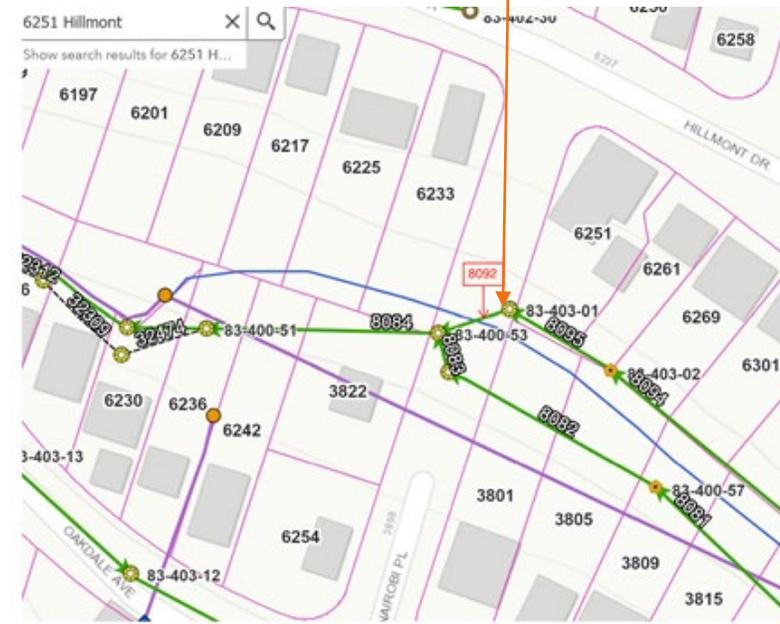
Location: Bank of Chimes Creek in City Right-of-Way next to 6251 Hillmont Drive.

Description: Storm eroded the bank and exposed sewer manhole in creek. Repair needed to prevent further erosion impacting public and private property.

Total Cost Estimate: \$200,000



Exposed sewer manhole due to creek bank erosion. Fence at 6251 Hillmont Drive boundary may be encroaching into City ROW



Landslide/ Erosion on City Owned Parcel



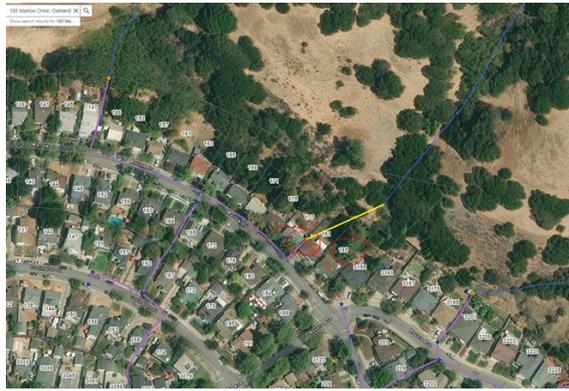
Location: adjacent to 185 Marlow Dr.

Description: Early January 2023, City-owned hillside parcel, APN #48-5813-1-8, and a private hillside parcel, APN #48-5813-2-5, landslide/erosion caused significant mud to enter private properties on Marlow Drive and the street.

Permanent hillside stabilization measures needed on the City parcel to prevent future erosion and impacts to private properties and road.

Total Cost Estimate: \$400,000

Completed= 0%



4121 Saint Andrew Rd. Landslide



Overflow storm water caused landslides on the hill. Large tree fell on City's street requiring major cleanup and hill restoration.

Total Cost Estimate: \$150,000



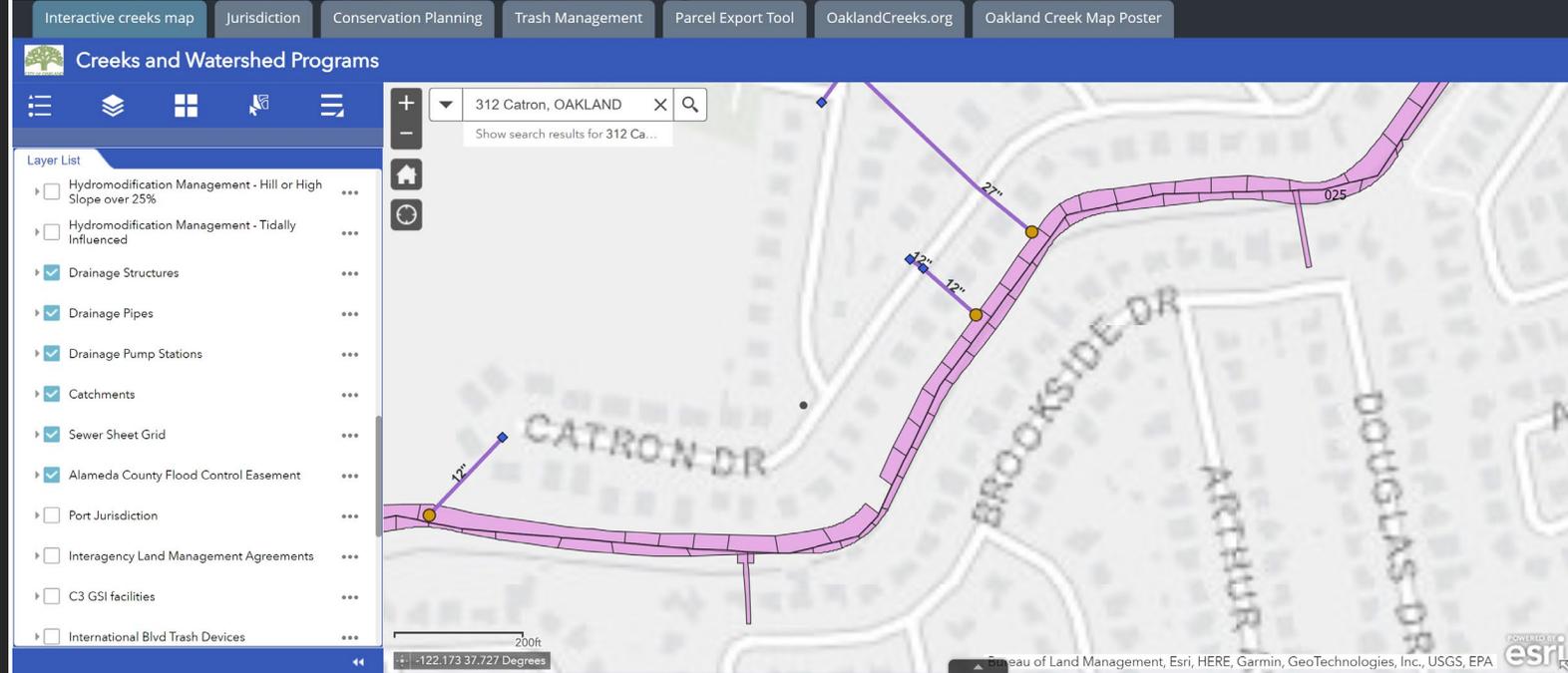
312 Catron Drive



- Major erosion/sink hole
- Disconnected City storm drain conduit from the outfall channel
- Urgent repairs needed

Total Cost Estimate: \$150,000

Completed: 0%



Tree Emergencies

Tree Services had addressed 22 priority 1 Tree Emergencies and 15 Priority 2 tree debris clean-ups since 1/25. There are still 79 storm-related follow-up work orders to be completed for trees down in parks, or woody debris left on the side of the road. Clean up will continue for several weeks. In many cases, large logs can be repurposed as barriers or sitting areas.

Total Estimated Cost \$1,000,000

Completed: 80%



OPW Assets Damaged by 2023 Storms

Category	Name of damage/facility	Describe Damage	Primary Cause of Damage	Approx. Cost	% Work Complete
A	6000 Shepherd Canyon Road	Landslide and major erosion caused sediment to enter roadway and clog nearby storm drains. This caused flooding in the area. Construction work was needed to restore storm drain systems. The City removed heavy mud and sill and unclogged the storm drains.	Landslide	\$40,000	40%
A	7698 Surrey Lane Temporary Stabilization	1/6/23, large rain event precipitated significant mud on 13971 Skyline Boulevard. Causing a Mud slide onto the property at 7698 Surrey Lane. The sediment filled an ephemeral creek channel that runs on both parcels and redirected water, which normally flows into a City storm drain easement 7698 Surrey Ln. The sediment clogged the City's storm drain and a large pile of mud filled up the ephemeral channel. The City sent a geotechnical engineer to assess and a contractor to remove mud to clear the channel and reestablish flow into the City's storm drain easement.	Landslide	\$250,000	100%
A	Various locations Tree Removal	<p>The Tree Services unit has responded to 625 downed trees since the beginning of January. This number does not include downed limbs, which also requires a significant level of response and cost.</p> <p>The projected costs of response for all winter tree response activities will significantly exceed the unit's annual budget of \$200,000 for responding to tree emergencies. That budget was already partially expended before the beginning of the calendar year (funding is issued at the beginning of the fiscal year in July and tree emergencies occur year-round).</p> <p>To date the Tree Services unit has received all January storm contractor invoices totaling \$405,661.23. February and March invoices are still being received but it is anticipated total contractor costs will be between \$1 - \$1.5 million.</p>	Wind	\$1,000,000 - \$1,500,000	60%
TOTAL ESTIMATED DAMAGED PER FEMA CATEGORY A:				\$2,000,000	

Category	Name of damage/facility	Describe Damage	Primary Cause of Damage	Approx. Cost	% Work Complete
B	West moorland Dr	Tarping installed at existing landslide site to protect from further soil movement	Severe Storm	\$10,000	100%
B	Grandview Rd	Tarping installed at existing landslide site to protect from further soil movement	Severe Storm	\$10,000	100%
B	Merriewood Dr Emergency Response	Flooding caused roadway edge failure. Emergency contractor needed to tarp exposed, eroded hillside and to install safety measures. Geotechnical consultant was sent to site to assess and determine urgent measures needed and urgency of permanent repair.	Landslide	\$30,000	100%
B	Bay Forest Dr. @ Tunnel Rd. culverts emergency repair	Hillside erosion after culverts clogged with sediment requiring emergency repairs.	Severe Storm	\$50,000	100%
B	Longcroft and Chelsea Drives storm drain - assessment	Flooding at 6470 Longcroft Drive, intersection flooded after storm drain became blocked with sediment. Emergency pumping, sandbag installed to mitigate flood.	Flood	\$20,000	100%
B	Longcroft and Chelsea Drives storm drain - improvement	Flooding at 6470 Longcroft Drive, intersection flooded after storm drain became blocked with sediment. Emergency pumping, sandbag installed to mitigate flood.	Flood	\$100,000	0%
B	769 Santa Ray Storm Drain Emergency Repair	1/6/23 rain caused erosion/sinkhole around storm drain along City easement on private property. Storm drain easement located between two residences. Emergency repair needed to avoid foundation settlement.	Flood	\$5,850	100%
B	Various Locations Landslide cleanup	January Winter storm landslide stabilization. Emergencies caused by rain storms at various locations (West Moorland, Grandview, etc.)	Severe Storm	\$200,000	0%
TOTAL ESTIMATED DAMAGED PER FEMA CATEGORY B:				\$1,125,850.00	

Category	Name of damage/facility	Describe Damage	Primary Cause of Damage	Approx. Cost	% Work Complete
C	Oakland Zoo Entrance	Oakland Zoo Entrance with embedded culvert completely washed off during rain storm, causing the entire entrance roadway failed and collapsed	Severe Storm	\$650,000	100%
C	Golf Links Rd (location 1)	Roadway edge failure requiring single lane traffic closure.	Landslide	\$250,000	0%
C	Golf Links Rd (location 2)	Roadway edge and guardrail failure.	Landslide	\$250,000	0%
C	Claremont Ave (location 1)	Roadway edge failure encroaching on traffic lane	Landslide	\$100,000	0%
C	Claremont Ave (location 2)	Roadway edge failure that damaged guardrail	Landslide	\$100,000	0%
C	Merriewood Dr Permanent Repair	Roadway edge failure encroaching on traffic lane	Landslide	\$75,000	0%
C	Tunnel Rd	Roadway edge failure encroaching on traffic lane	Landslide	\$150,000	0%
TOTAL ESTIMATED DAMAGED PER FEMA CATEGORY C:				\$1,575,000	

Category	Name of damage/facility	Describe Damage	Primary Cause of Damage	Approx. Cost	% Work Complete
D	Bay Forest Dr. @ Tunnel Rd. culverts - long term fix	Hillside erosion after culverts clogged with sediment requiring permanent	Severe Storm	\$300,000	0%
D	Lion Creek between Leona Creek Dr. and Union Pacific Railroad/San Leandro Blvd.	Basement of Coliseum Connections Apartments flooded 12/31/22 (805 71st ave oakland ca). The City storm drain system was not clogged but is influenced by tides. A project to add a flap gate at Outfall to Lion Creek will reduce flood events in the adjacent neighborhood including around 805 71st Ave Oakland CA.	Flood	\$250,000	0%
D	769 Santa Ray Storm Drain Permanent Repair	To prevent future sinkholes caused by heavy rainfall, the City repaired the entire 144-foot storm drain, a portion of which was damaged in FEMA 4683-DR-CA event at 769 Santa Ray.	Flood	\$60,000	30%
D	1815 Woodhaven Storm Drainage Improvement	Stormwater flood flows down Overlake Ct. are not being captured by existing inlets on Overlake Ct. and instead flow down the 15' path behind 1815 Woodhaven and onto private properties.	Flood	\$200,000	0%
D	4525 Harbord Dr.	Damaged storm pipe located under 4525 Harbord Dr. The property owner noticed a small sinkhole forming in the basement, running along the area where the storm pipe runs under the home. CCTV footage indicates the pipe has multiple fractures throughout.	Flood	\$250,000	0%
D	4100 Redwood Rd.	1/4/23 - On south side of property City storm drain runs along residential homes, under a parcel, and out to Redwood Rd. The City's 22" storm drain on 4100 Redwood cracked during December and early January rains causing water to shoot onto 4100 Redwood Rd and run down the neighboring parcels. Repair is needed.	Flood	\$200,000	0%
D	Chimes Creekbank Erosion on City Right-of-Way	Flooding eroded Chimes Creek bank around a sewer manhole. Requires biotechnical bank stabilization to protect adjacent private property and City right-of-way.	Flood	\$300,000	0%

D	15 Mall Court Landslide	Broken sewer line resulting from fallen tree caused by landslide and severe January winter storm. Temporary repair completed, flow is operational. Permanent repair planning underway. City staff developed emergency repair plans and hired emergency contractor. Work will be completed spring 2023.	Landslide	\$200,000	10%
D	7698 Surrey Lane Permanent Repairs within City easement	Repair and improve storm drainage inlet located within easement on 7698 Surrey Lane to help prevent clogging caused by flooding/landslides in the future.	Landslide	\$100,000	0%
D	Bay Forest Dr. @ Tunnel Rd. culverts emergency repair	Hillside erosion after culverts clogged with sediment requiring emergency repairs. The culverts require permanent replacement	Severe Storm	\$100,000	0%
TOTAL ESTIMATED DAMAGED PER FEMA CATEGORY D:				\$1,970,000	

Category	Name of damage/facility	Describe Damage	Primary Cause of Damage	Approx. Cost	% Work Complete
G	Chelsea Court - Assessment	Hillside erosion from concentrated stormwater flows onto property. City contractors assessed potential future storm drainage structure.	Severe Storm	\$10,000	0%
G	Chelsea Court - Storm drainage installation	Hillside erosion from concentrated stormwater flows onto property. City contractors assessed potential future storm drainage structure.	Severe Storm	\$100,000	0%
G	Palos Colorado trail in Joaquin Miller Park - assessment	Landslide onto trail resulting in trail closure and concerns for emergency vehicle access above. Assessment conducted to develop repair urgency recommendation and recommendation for future repair.	Landslide	\$10,000	100%
G	Landslide/erosion on City-owned parcel adjacent to Marlow Drive	Early January 2023, City-owned hillside parcel, APN #48-5813-1-8, and a private hillside parcel, APN #48-5813-2-5, landslide/erosion caused significant amounts of mud to enter private properties on Marlow Drive and the street. 185 Marlow Dr. most affected. Street was covered in mud. Permanent hillside stabilization measures needed on the City parcel to prevent future erosion and impacts to private properties and road.	Landslide	\$400,000	0%
G	Dimond Park Erosion	Sausal Creek flooded and caused erosion damage to a repaired sinkhole that formed due to a retaining wall in poor condition. The entire length of poor condition retaining wall protects the park from the creek and should be removed and creek bank laid back - install biotechnical bank stabilization measures.	Flood	\$1,000,000	0%
G	Palos Colorado trail in Joaquin Miller Park - repair	Landslide onto trail resulting in trail closure and concerns for emergency vehicle access above.	Landslide	\$100,000	0%
TOTAL ESTIMATED DAMAGED PER FEMA CATEGORY G:				\$1,620,000	

Damage Description/Cost Estimate – Roadway Repairs (10) Sites

Location	Description	Cost Estimate
Claremont Ave. 200 ft. south of INT Alvarado Rd. NW side of roadway	stream embankment slide EOP/utility undermining	\$70,000
Claremont Ave. 50 ft. NE of #7845 House, NW side of roadway	stream bed embankment slide EOP/utility undermining	\$70,000
2656 Haverhill Dr	Roadway separation cracks	\$230,000
5726 Shepherd Canyon	tree root ball/potential EOP undermining	\$240,000
6956 Tunnel Road	Storm pipe outflow repairs	\$210,000
10424 Golf Links Road	section of guardrail on both sides of the road damaged and suspended.	\$250,000
10249 Golf Links Road	Undermining of Roadway	\$250,000
1260 Grandview Drive	Tarping	\$5,000
6391 Longcroft Drive	Roadway Clean-Up	\$5,000
6441 Longcroft Drive	roadway undermining at open stormwater ditch roadside. New 4' high retaining wall	\$125,000
	Total (10) sites	\$1,455,000

