Cause Analysis and Solution to the Quality Problems of Municipal Road Engineering

McLoughlin
School of Civil Engineering, Central State University of New York, NewYork, 12201, America

Abstract: According to the recent municipal road construction experience, embankment and trench back filling subsidence, cracking in the pavement structure, pipeline leakage, inspection wells surrounding pavement subsidence and other auxiliary facilities of quality defects cause analysis, and put forward the corresponding control measures, to ensure that the quality of construction of municipal engineering.

Keywords: Road engineering; Quality problem; Reason; Prevention and control measures

1. Introduction

In recent years, all to vigorously carry out the construction of municipal roads, municipal roads engineering have different from the characteristics of other road projects. This is due to the urban road red line within a synchronous pipeline and underground facilities and road engineering construction, urban traffic situation does not allow long duration, a variety of urban public facilities, transportation facilities and road construction synchronous construction. Which greatly increased the complexity of the municipal road engineering construction, often appear some special quality defects, mainly appear in the joint part of the sub-grade and pavement, drainage system and auxiliary facilities cross construction, the author combines recent municipal road construction experience, the common quality defects and prevention measures for following analysis.

2. Subgrade and Pavement

2.1. Subgrade, trench backfill settlement

Subgrade strength and stability is to guarantee the basic conditions of the road pavement strength and stability, due to the urban road underground part to the laying of various pipelines, and the trench backfill compaction is directly related to the stability of the roadbed, road subgrade construction, the embankment filling and pipeline trench backfill is the key parts of the roadbed construction. Back filling construction process of super thickness backfill, tilt rolling, soil quality does not meet the requirements, the backfill soil moisture control is not good, will cause the backfill soil compactness is not standard, lead to subsidence of subgrade and pavement structure, the upper part of the tube body rupture, unreinforced tube may also be flattened. Direct fill the inclined rolling will make the rolling machine can not play the biggest compaction function, slope is greater loss of compaction power is bigger; fill in such as entrainment of large particle size lump, hinder soil particles interacting squeezing, amounted to less than the overall density effect, on the other hand, lumpy cushion roller mechanical grinding wheel, stacked phenomenon, which lumps left around voids, later subsidence; trench water will cause water saturated state, not solid, easy to cause the trench backfill subsidence, and thus endanger the overall stability of the roadbed.

Treatment methods: 1) construction site technical responsible person to the construction personnel do technical clarification, backfill virtual paving thickness is determined according to the tonnage of the compaction machinery. 2) in the roadbed width, should use the horizontal lamination construction method. 3) the horizontal or vertical slope of the original ground of the subgrade should be more than 1: 5. 4) when the trench backfill section of the fill, should be set aside to step, step height is equal to the thickness of the compaction, the width of not less than 1 m, soil particles to ensure that no debris. 5) trench water to drain the water, as the bottom case of sand gravel or rubble inserted for processing, and then according to the requirements of backfill.

3. Matters Needing Attention During Construction Period

According to the design drawings strict according to CJJ 1-2008 urban road engineering construction and quality acceptance of norms of construction specifications and construction rules of construction preparation and construction surveying and setting out work. During construction take the necessary drainage measures to ensure the roadbed dry, to ensure the roadbed compaction. According to the distribution along the ditch Creek, pond excavation of drainage ditches, the longitudinal slope of the channel bottom is not less than 0.3%. The pressure well to prevent subsidence, smooth and dense, and no obvious wavy wheel track. Upon examination of the density of the requirements to achieve the required level of earthwork.

Road tank was compacted by dressing should be flat and compact, there is no obvious compacted wheel tracks, no frost boiling, the spring and the fluctuation of transverse slope and road design transverse slope. If there is a large area of miscellaneous fill along the road, the soil foundation can not reach the design requirements, should be filled with gravel, the thickness is not less than 50 cm. If fill engineering several operation construction, every layer filling and transfer to adjacent areas, if each other not at the same time filling to fill area should be outward layer remain level, each step width not less than 1 m, height should be no more than 30 cm. Such as the two area while filling, it should be stacked with each other overlapping convergence, that is, a layer extends to the adjacent area 50 cm, sub layer indentation 50 cm. Subgrade engineering construction must strictly implement the 1-2008 CJJ urban road engineering construction and quality acceptance specification and other related construction specifications and construction technical specification requirements. Road engineering construction technical requirements, material selection, construction and acceptance, quality inspection and evaluation of shall be strictly enforced: GB50092-96 asphalt pavement construction and acceptance specification, JTJ 036-98 highway asphalt pavement construction technical specification, CJJ 1-2008 urban road engineering construction and quality acceptance specification, JTJ highway 034-2000 pavement base construction of technical specifications, JTJ 076-95 highway engineering construction safety technical specification for according to the following countries related construction specifications and technical specification for construction requirements.

3.1. Pavement cracking, sand, honeycomb

The main reasons for this type of problems are: 1) the stability of cement is not up to the standard, concrete in the process of mixing water cement ratio is too large, reducing the surface strength, the construction is completed by the use of wear and tear. 2) in the process of construction, the time is too early or too late to wipe the pressure, in the concrete surface and dry cement or water, did not require the maintenance or age of the opening of the opening and other causes of skin cracking or peeling. 3) sand, stone, cement and water, no measurement error or short mixing time, uniform mixing, resulting in concrete segregation. 4) not in accordance with the operating procedures of pouring concrete, the material is not high, the leakage or vibration, the bubble in the concrete is not ruled out. 5) the template assembly is not strong, not strict, the template surface cleaning is not clean, remove the film agent brushing uneven or local leakage brush. 6) the cracks in the concrete surface layer mainly include: dry shrinkage cracks and construction cracks caused by improper cracks.

The above diseases to take the following measures to control: 1) strict control of water cement ratio, master good surface layer of the cast of the time interval and the number of times, is strictly prohibited in the concrete surface and dry cement or water. 2) concrete mixing station to have cement stock, to ensure the stability of cement stability. 3) template to clean up, remover painted in uniform, shall not leak brush, concrete must be according to the operating rules of placement, to prevent the leakage of vibration isolation, vibration to bubble out so far. 4) strict control of the ratio of concrete, water cement ratio and sand ratio can not be too large, and control the amount of sand and gravel. 5) as far as possible to choose the time of pouring concrete, to avoid hot weather construction of large area of concrete, according to the standard requirements of the right to retain construction joints. 6) to strengthen the early curing of concrete and appropriate to extend the curing time, covered with straw, straw bags, to avoid exposure to, regular watering to keep moist.

3.2. Pipeline seepage, closed water test is not qualified

Reason: 1) the pipeline foundation condition causes the uneven settlement, causing the local water, the serious when the pipeline breaks or the crack of the interface. 2) pipe quality is poor, the pipeline under the effect of external damage or crack. 3) pipeline interface construction quality is poor, the existence of cracks or loose, resulting in poor permeability resistance, resulting in leakage. 4) check the construction quality is poor, and the connection pipe of the combination of the wall leakage. 5) closed water seal is not tight. Prevention: 1) carefully according to the design specifications and construction requirements to ensure the strength and stability of pipeline foundation, when poor geological and hydrological conditions of the foundation should be for soil treatment, in order to increase the bearing capacity of the bottom of the trench. If tank bottom soil disturbed or by water immersion should be dug in soft soil with sand or gravel backfill, underground water level following excavation, should do the pit at the bottom of the dewatering and drainage work to ensure a successful excavation, when necessary can be set aside 20 cm thick soil layer at the bottom of the groove, to be continued after the construction process with dig with the construction. 2) with the relevant units of the pipe and the quality inspection department of product qualification certificate and material mechanical test reports, etc., the appearance quality of the pipe is no defect. 3) selection of better quality of the interface of filler and according to the test with the ratio and the reasonable construction organization construction, the interface slot to ensure clean, to cement filler interfaces to pre wet and oily should be pre drying after brush bottom oil. 4) inspection wells masonry mortar pointing

to full, do not miss a comprehensive, before finishing clean and moist surface, the pressure of light collecting and timely maintenance. In case of groundwater, with masonry plastering and pointing at the same time, no further in finishing or pointing in backfill. And inspection well cohesion before laying, pipe surface should first wet and uniform brush a layer of cement slurry, pipeline in place and then make the internal and external plaster, to prevent leakage. 5) masonry wall before should the nozzle 0.5 m about within the scope of the inner wall of the pipe clean, coating of cement puree, but at the same time, the bricks alternate wetting. Block masonry mortar label should not be less than M7.5, and with good consistency, pointing and plaster with cement mortar grade is not lower than M15. Inside and outside diameter should be double pointing is larger, smaller only single pointing or finishing. 6) the conditions permit can be used to seal the well before the inspection well, in order to ensure the quality, and the preset drainage hole is in the bottom of the tube to check the quality of the pipe at the bottom of the tube.

3.3. Inspection wells surrounding the road surface subsidence collapse

Municipal Drainage Engineering most of the rainwater inspection wells are located in the driveway, a lot of drainage pipe and manhole is also located in the driveway. In most cases, it is difficult to check the width of the well and the compaction quality is not easy to control, and the compaction degree is difficult to carry out. Construction such as negligence or strict monitoring, it is inevitable that around inspection wells backfill quality problems occur, resulting in around inspection wells and the road link appear collapse subsidence, inspection shaft deformation and subsidence caused by driving "bump" phenomenon. The quality of the covers and the poor quality of the installation, installation of iron ladder is too random, affecting the appearance and use. Control measures: 1) strictly control the construction quality of the inspection well base and cushion layer, to prevent the phenomenon of well sinking. 2. Strictly control the quality of the inspection well, and control well the position and height of the well and the well head to prevent the deformation of the well. 3) check the well with the necessary support, the installation should be full of mud, and the weight of the model and the bottom of a good use. Iron ladder installation should be controlled well, the first step of the position, the deviation should be in a reasonable range, the plane position is accurate.

4. Auxiliary facilities

Because the blind in the crosswalk mouth is downhill, causing the plate cut and protruding pavement. Once the quality of the installation of a slight error, easy to produce the phenomenon of road plate. This is also the municipal road engineering quality defects often appear. Construction units in before construction technical clarification, put forward to strengthen the blind orifice plate installation and construction quality control, and strictly control the grade of mortar, dry humidity and mortar plumpness, if necessary, can be the mortar label to improve a grade.

Sidewalk Street manhole cover plate and the road surface elevation exceed the standard on the sidewalk Street manhole cover board and the road surface elevation exceeding prone to stumbling phenomenon in the construction of sidewalks, due to the large manhole cover board, it is difficult to install, prone to check the cover plate and pavement height exceeded the phenomenon, after delivery may stumble phenomenon. The construction unit to check one by one, and resolutely rework unqualified, until the target date.

5. Conclusions

In summary, the quality of the common disease is to prevent and take measures to eliminate the. In order to ensure the quality of the project, the municipal road projects we do it better and more perfect, we should further straighten out the quality management system, continuously improve enterprise management level, strengthen of supervision and management in the process of engineering construction, to seize the key link and important process, strictly abide by the design and construction technical standards, to prevent the emergence of quality problems; introduction of responsibility for the implementation of the management system, eliminate a variety of quality defects easily occurred in the construction process, from the system to ensure the steady improvement of the quality of engineering, municipal engineering construction quality and strive to achieve excellent.

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