

Fundamentals of Road Construction

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Lecture 5

The subject of the lecture:

Materials used in road construction and technology of building roads

Materials used in road construction:

- bitumen (asphalt binder)
- mineral filler
- aggregate
- hot mix asphalt (consist form 3 ingredients presented upper)
- cement concrete
- bitumen emulsion
- aggregate mechanically stabilized
- soil or aggregate stabilization using hydraulic binders
- geosynthetic

BITUMEN



Source: <http://versenergy.com/wp-content/uploads/2015/10/bitumen-slide-01-1500x580.jpg>

NATURAL ASPHALT (BITUMEN)



Source: https://www.butobu.rs/members/web_pages/im_greengroup_1478035582.jpg

TAR SANDS



Source: Suncor Energy Inc.

SBS POLYMER



Source: <https://images.sstatic.com/akrylonitryl-butadien-styren-abs-granulki-1552607z3-000000164.jpg>

GRANIT AGGREGATE



Source: <https://6.allegroimg.com/s512/0196d7/187648aa456487e6ab1e57e0e9f6>

MINERAL FILLER



Source: <https://pl.all.biz/img/pl/catalog/137666.jpeg>

HOT MIX ASPHALT



SURFACE OF THE ASPHALT CONCRETE



Source: https://upload.wikimedia.org/wikipedia/commons/thumb/5/5b/Asphalt_concrete.JPG/1280px-Asphalt_concrete.JPG



MMA typu SMA
(Stone Mastic Asphalt)



MMA typu AC
(Asphalt Concrete)

Source: http://images.slideplayer.com/13/3868207/slides/slide_3.jpg



Source: <https://i.pinimg.com/originals/2b/56/23/2b5623db42178b15e3f0a5de901fc746.jpg>



Source: <http://blogdrogowy.blogspot.com/>



Source: <http://www.lerncoach.li/wp-content/uploads/2014/12/img24-4.jpg>



AGGREGATE MECHANICALLY STABILIZED

Source: http://s17-pulawy.pl/foto/zdjecia/listopad2016/P_11.jpg



Source: http://www.rozbudowadw761.pl/wp-content/uploads/2017/06/DSC_0227.jpg

SOIL STABILIZATION USING HYDRAULIC BINDERS



Source: https://www.gorazdze.pl/sites/default/files/styles/header_slider/public/assets/images/20170224_114814.jpg?itok=s9NE25Up

TECHNOLOGY OF BUILDING ROADS

Road construction equipment:

- asphalt mixing plant
- motor grader
- asphalt paver
- road roller machine
- excavator
- wheel loader, bulldozer
- dump truck

Standard technological process of building road surface:

Making a road trough using motor grader, bulldozer.

Improving subgrade using mechanical or chemical stabilization.

Carrying out excavations and embankments with excavators.

Construction of the base layer.

Transport using dumping trucks of the asphalt mixture from the asphalt mixing plant to the place of building.

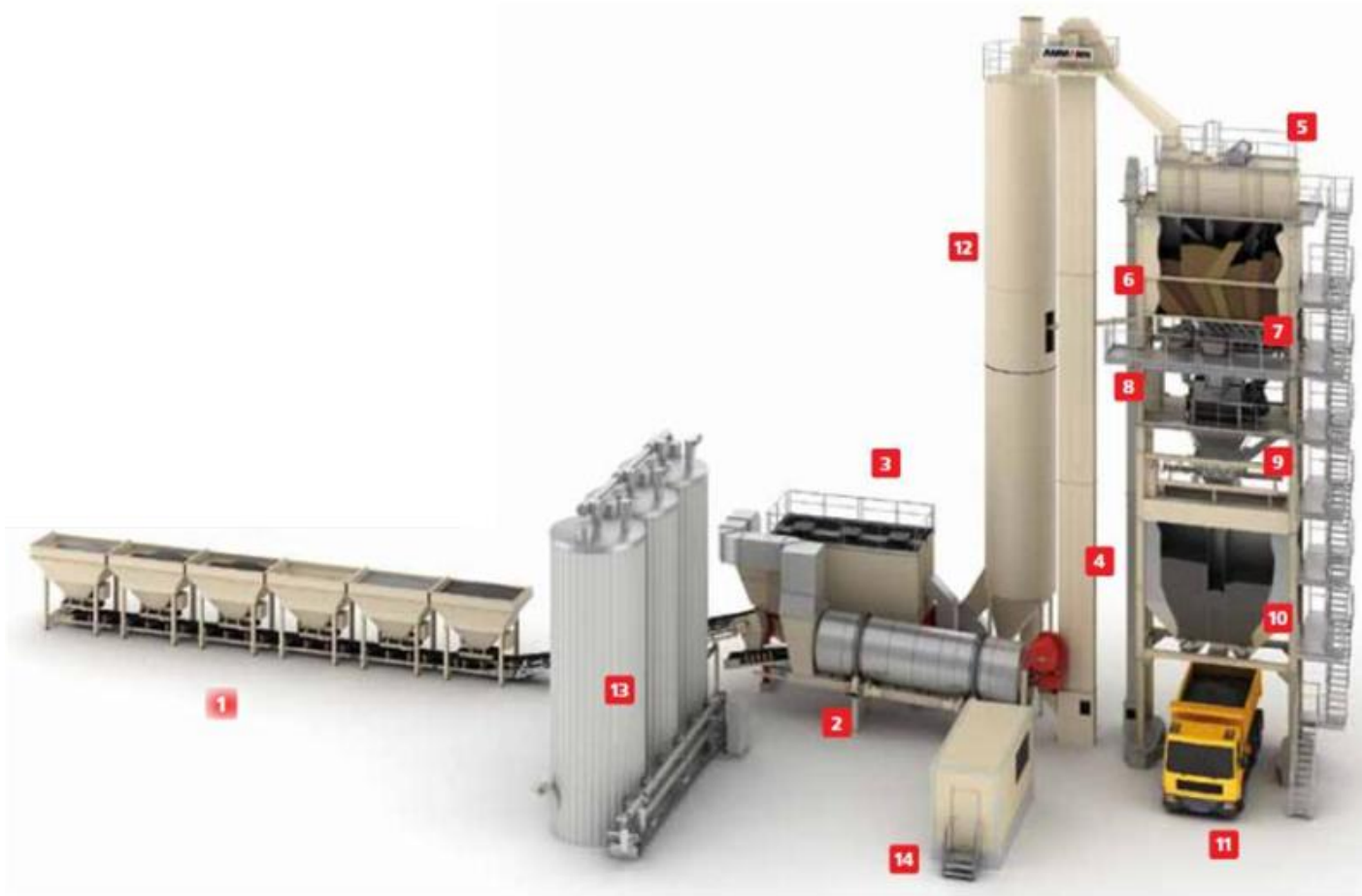
Building a asphalt layer using asphalt paver.

Static and vibration compaction of the hot mix asphalt using of steel and rubber road roller machines.

In the case of building a layer other than the wearing course, possible sprinkling with bitumen emulsion before laying the next layer.

In the case of using a SMA mix, scattering aggregate in order to roughen the surface.

ASPHALT MIXING PLANT



Source: <https://www.ammann.com/en/plants/asphalt-plants>

MOTOR GRADER



Source: <https://www.constructionkenya.com/2408/road-construction-equipment/>

ASPHALT PAVER



Source: <https://www.constructionkenya.com/2408/road-construction-equipment/>

ROAD ROLLER MACHINE



Source: <https://www.constructionkenya.com/2408/road-construction-equipment/>

EXCAVATOR



Source: <https://www.constructionkenya.com/2408/road-construction-equipment/>

WHEEL LOADER



Source: <https://www.constructionkenya.com/2408/road-construction-equipment/>

DUMP TRUCK



Source: <https://autoline.info/-/sale/dump-trucks/MAN-TGS-18-440-4-x-4--21012908135330484200>

THANK YOU FOR YOUR ATTENTION